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BULLETIN OF THE SCHOOL OF EDUCATION
INDIANA UNIVERSITY

A Survey of the Achievement in Arithmetic of 11,348 Sixth Grade Pupils in 486 Schools in Indiana

By
MERRILL T. EATON

A List of Bulletins in the Field of Education, Indiana University

By
KATHLEEN DUGDALE

Published by
BUREAU OF COOPERATIVE RESEARCH AND FIELD SERVICE
Indiana University

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Special acknowledgment is due the teachers, principals, and superintendents who so willingly gave of their time to participate in the testing program.

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M.T.E.

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A Survey of the Achievement in Arithmetic of 11,358 Sixth Grade Pupils in 486 Schools in Indiana[1]

by

MERRILL T. EATON,[2] Professor of Education, Indiana University

INTRODUCTION

THE purpose of this survey is to determine accurately and objectively the achievement of sixth grade pupils in arithmetic so that (1) the development and growth of the individual pupil may be most rapid and efficient; (2) the teacher may have an accurate, reliable, and valid evaluation of the achievement of her pupils in order that the best possible teaching of the content may be attained; (3) comparable information may be provided for utilization by the supervisor, the principal, and the superintendent in the organization of the curricula in arithmetic for the best possible development of the pupils in each school and in the school system as a whole; and (4) state-wide knowledge of the achievement of sixth grade pupils in arithmetic may be available and used as a basis for evaluating the state recommended course of study in the areas measured.

Educators have known for a long time that there is a direct relationship between the achievement of pupils in a subject and the degree to which objective accurate measurement has been applied. Education has been variously described as a philosophy, as an art, and as a science. From any one of these points of view, however, education accepts and recommends measurement. A study of the history of educational development in the United States shows vividly that improvement in education has been closely related to improvement in measurement. Therefore this study in measurement of achievement in arithmetic is following an accepted principle for making education more efficient.

No definite statement may be made concerning the relative achievement of sixth grade pupils in the different elementary schools in Indiana because no single standardized measure has been applied to an adequate sampling of sixth grade pupils in the state. Neither is it known to what extent factors such as the length of the school term, number of pupils in the class, size of school, number of grades in the room, amount of time given daily or weekly to the subject, and departmentalization in school organization affect the achievement of pupils. This survey of achievement of sixth grade pupils in arithmetic provides definite evidence concerning the problems listed.

There are yet many controversial questions connected with the teaching of arithmetic in the elementary schools. Educators have not

[1] The achievement in social studies of the same sixth grade pupils was also measured; the results of the testing will appear in the Bulletin of the School of Education, Vol. XX, No. 3, May, 1944.

[2] Testing and Research Consultant to the State Department of Public Instruction.

been in agreement on many points, for example, the grade in which the study of formal arithmetic should begin and what should be taught and how it should be taught. The methods and techniques followed should be those which lead to the highest pupil achievement. It is hoped that this study will provide data on which to base a more uniform and more efficient program in arithmetic.

The war has created a great demand for individuals thoroughly trained in mathematics. In order that public schools may train pupils efficiently in arithmetic, training must start with a complete mastery of the fundamentals in the elementary school. It is futile to attempt to teach advanced mathematics in the senior high school to pupils who are deficient in the fundamentals of arithmetic. The results of this study will be of value to the war effort in that they provide information concerning the present relative achievement of sixth grade pupils in arithmetic. With this information as a basis, changes may be made in the arithmetic program of the elementary school which it is hoped will lead toward more efficient teaching.

TESTING PROCEDURES

During the school year of 1941-42, a state-wide survey[1] was made of the language arts achievement of sixth grade children in Indiana. The results of this study stimulated a great deal of interest among school people who requested that a similar survey be made of the achievement of sixth grade pupils in arithmetic. At the request of the school people of the state, the State Superintendent of Public Instruction appointed a committee to plan the testing program. The committee members selected were: Herbert Atchley, Ruthanna Davidson, Merrill T. Eaton, Thomas Fogarty, Allegra J. Ingleright, Joy M. Lacey, W. E. Loper, Charles Lykins, Clarence Pound, W. W. Wright, and J. Fred Murphy.

The committee made the following recommendations: (1) the Stanford Intermediate Arithmetic Test, Form DM[2], should be used; (2) the sixth grade teachers should be informed that the testing is not in any sense a measure of the teacher's instructional ability, but that it is being carried on to improve pupil efficiency in learning arithmetic; (3) the sixth grade teachers should be given the responsibility for administering the tests; (4) the tests should be given between April 16 and May 15, 1943; (5) city and county superintendents, through their elementary principals, should assume the responsibility for sending a copy of the results to the Bureau of Cooperative Research and Field Service, Indiana University; (6) a special record form should be prepared and distributed with the test booklets so that, in addition to the test scores, pertinent information concerning the pupils and the school could be obtained; and (7) a report of the results of the testing should be prepared, published, and distributed to all schools.

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[1] *A Survey of the Language Arts Achievement of Sixth Grade Children in 18 Counties and Six Cities in Indiana*, by Merrill T. Eaton. Research Bulletin No. 3, *Testing*, State Department of Public Instruction, Indianapolis, 1943.

[2] By Truman L. Kelley, Giles M. Ruch, and Lewis M. Terman, published and copyrighted by the World Book Co., New York, 1941.

The testing program recommended by the committee was accepted by the State Superintendent of Public Instruction. City and county superintendents, elementary principals, and sixth grade teachers were informed of the testing program and were invited to participate. Although participation was on an optional basis, all elementary schools were encouraged to take part.

The names of the participating schools, superintendents, principals, and teachers are given in Table I. City schools are listed first, in alphabetical order. Participating township schools follow the city schools and are listed alphabetically by county. A third group of schools listed is that of special schools, which include parochial, special, town, state laboratory, joint township, consolidated town and township, and joint town and township schools. These are also listed in alphabetical order by location. Throughout this study these schools are referred to as special schools to distinguish them from city or township schools.

FIG. 1. LOCATION OF PARTICIPATING SCHOOLS

The 11,358 sixth grade pupils included in this study should constitute an adequate sampling since they make up about 25 per cent of the sixth grade enrollment in the state. Many of the schools participating in the study had more than one sixth grade teacher, and

TABLE I. CITY, COUNTY, AND SPECIAL SCHOOLS PARTICIPATING IN THE STUDY

School	Principal	Teachers
CITY		
AUBURN (H. L. McKenney, Supt.)		
DeSoto	B. L. Bailey	B. L. Bailey
Harrison	Fred S. Zeigler	Alice Reed, Lee S. Duquid
BATESVILLE (Richard H. Prentice, Supt.)		
Grade No. 2	Stanton O. Nickel	Stanton O. Nickel, Walter G. Lehman
BEDFORD (H. H. Mourer, Supt.)		
Junior High	Earl Krausbeck	Merle Stone, Lyman Wagoner
Lincoln	Iris F. Robb	Mildred Pace
Madden	Emma Kirk	Emma Kirk, Eva Hart
Stalker	J. J. Tatom	Edith Rickard, Bysa E. Todd
BERNE (E. M. Webb, Supt.)		
Berne Public	C. I. Hirschy	Martha Schug
BLOOMFIELD (C. F. Henderson, Supt.)		
Bloomfield Grade	C. F. Henderson	Lela Dillon
BLOOMINGTON (H. E. Binford, Supt.)		
Elm Heights	Glen Allen	Daisy Ashbaucher, Russell Eller
Fairview	L. E. Dyer	Harold E. Stewart
Hunter	Fred G. Neel	Ed Saberniak, Marjorie Trisler
BRAZIL (Charles P. Keller, Supt.)		
Meridian	C. C. Sexton	C. C. Sexton, Gertrude Linton
Zeller	Grace Brummett	Grace Brummett
CANNELTON (H. R. Davidson, Supt.)		
Myers	Foster Park	Foster Park
CLINTON (E. C. Boyd, Supt.)		
Central	Agnes McGinty	Agnes McGinty, Alice O'Herron
Glendale	Irma Pesavento	Irma Pesavento, Mabel Lucas
Matthew	Loren T. Reed	Loren Reed, John Kyle, Elna Ware
COLUMBIA CITY (A. G. Kerr, Supt.)		
West Ward	Max Gandy	Max Gandy
COLUMBUS (Otto Hughes, Supt.)		
Garfield	W. D. Richards	W. D. Richards
Jefferson	A. Buryl Lind	A. Buryl Lind
McKinley	Lloyd Reece	John Elliott, Bernice Wagner
Wilson	J. O. Kelly	Helen Ray
CONNERSVILLE (Edwin C. Dodson, Supt.)		
East Side	Virgil DeBolt	Roscoe V. Carr
Eighth Street	Arlis Richards	Arlis Richards, Delories Underwood
Fifth Street	Loyd Kenworthy	Loyd Kenworthy, Delories Underwood
Grand Avenue	Wayne Masters	Wayne Masters
Maplewood	A. T. McCormick	Ethel Gatlin, Lillian Ridge
CORYDON (Robert Bulleit, Supt.)		
Corydon Graded	Herman Fleshman	Carleton Franks, Oral A. Kopp
CRAWFORDSVILLE (M. C. Darnall, Supt.)		
Horace Mann	Esther Burroughs	Esther Burroughs
John Beard	Okel Hesler	Okel Hesler
Lincoln	Ethel Bannister	Ethel Bannister
Mills	Cecil Tharp	Cecil Tharp, Esther Martin
Tuttle	Clyde B. Gentry	Ruthanna Davidson
Willson	Ralph L. Worley	Edna M. Kelley
DECATUR (Walter J. Krick, Supt.)		
Lincoln	W. Guy Brown	Electa Oliver, Madeline Spahr
DUNKIRK (Charles L. Johnson, Supt.)		
Sutton Elementary	Donald V. Smith	Donald V. Smith

TABLE I—CONTINUED

School	Principal	Teachers
ELWOOD (C. C. Hillis, Supt.)		
Central Grade	John E. Baker	Walter Allen, Roy Stuffle
Linwood	Frank Van Slyke	Frank Van Slyke, Forest Woods
Osborn	Hubert Waymire	Hubert Waymire
Washington	Adah Evans	G. H. Detro
EVANSVILLE (J. Ralph Irons, Supt.)		
Baker	Earle J. Tomey	Elston Blythe, Myrtle Thompson
Carpenter Grade	E. M. Lenon	Grace Cox, Clemma Wallace
Centennial	Guy Nicholson	Alma Martin, Bernice Sprague
Chestnut Walnut	Ralph Becker	C. R. Greeve
Columbia	E. M. Lenon	Elizabeth Brown
Daniel Wertz	Guy Nicholson	Evelyn Herrell, Eunice Schnautz
Delaware	Ross Brooks	Marie Campbell, Teckla Petersen
Emma Roach	J. Edwin Howe	Verna L. Miller, Grace Shornhorst
Fulton	J. Edwin Howe	Orlica Crabtree, Clara Scherffius
Henry Reis	Earle J. Tomey	Bettye Lant
Howard Rosa	Carl W. Lemme	Louise Atkin, Flossie Becknell, Bernice Stevens
John M. Culver	David R. Dudley	George Wimpelberg, Edna Brunner, Mae Yetter
Lincoln	Wm. E. Best	——— Churchill
Stanley Hall	Ralph Becker	Anne Boleman, Dorothy Ellerbush
Third Avenue	Wm. E. Best	Alfred D. Wiley
Washington	Carl W. Lemme	Florence Bock, Irene Jacobs
Wheeler	David R. Dudley	Mary C. Page, A. H. Watson
FRANKFORT (Waldo E. Wood, Supt.)		
James W. Riley	D. F. Pitman	John Barks
Lincoln	O. J. Gheen	Roberta Lewis, ——— Benbow
Samuel P. Kyger	John Redman	——— Spurgeon
Woodside	Claude L. Hampton	(Department)
FRANKLIN (Ralph W. Sheek, Supt.)		
Franklin Elementary	Hazel V. Stout	Nellie Moran
GARRETT (W. S. Painter, Supt.)		
Will Franks	Jesse Ober	Jesse Ober
GARY (Charles D. Lutz, Supt.)		
Ambridge	Blanche Rae	Bernice Beith
Beveridge	Grace L. Foster	Louise Uecker
East Pulaski	Melville Bryant	Jessie Trippe
Edison	John Reid	Marcella Jones
Emerson	Everett Spaulding	Mabel Keller, Jessie Phillips
Franklin	Elva Ruston	Coryl Blakley
Froebel	Richard Nuzum	Carrie Seberger
G. Park	Stella Z. Miles	Edward Wellman
Horace Mann	J. Lloyd Trump	Rose Burke, Bernadette Gaffney
Ivanhoe	Mary Castor	Charles S. Coons
Jefferson	Catherine Johns	Keziah Stright
Lew Wallace	Verna Hoke	Violet Sipavich
Riley	Elsa Wettengel	Hilda Jindra
Roosevelt	H. Theo Tatum	Ruth Roberts
Tolleston	James Standley	Emma Bertha, Olive Leskow
Washington	Blanche Williams	Margaret Stanley
W. A. Wirt	George Russell	Dorothy Rosbrugh
West Pulaski	Elsa Wettengel	Donna Mills
GOSHEN (Robert B. Weaver, Supt.)		
Chandler	Gerald D. Moyer	Gerald D. Moyer
GREENCASTLE (Paul F. Boston, Supt.)		
Delilah Miller	Susie Talbott	Dorothy Harris
Martha Ridpath	Ruby Hood	Hollis Masten
Mary Emma Jones	Minnie Bartley	Kathleen Hudson
GREENSBURG (Carl Billings, Supt.)		
East	Charles Clifton	Charles Clifton
West	Loren Garner	George Rush, Dorothy Tomson
GRIFFITH (Buell E. Crum, Supt.)		
Franklin	Richard Beck	N. W. Michel

TABLE I—CONTINUED

School	Principal	Teachers
HOBART (Harlie Garver, Supt.)		
Central Elementary	Florence Wagoner	Burdell Murray
Mundell	Glenn E. Moss	Glenn E. Moss, Evalyn Rogers
West Hobart	Raymond Gregory	Raymond Gregory
HUNTINGBURG (Ray G. Goldman, Supt.)		
Huntingburg Elementary	Raymond Pflug	Raymond Pflug, Russell Waddle
HUNTINGTON (Burton Stephan, Supt.)		
Central	H. Jay Scheiver	Mary Kavanaugh
Horace Mann	H. Glen Priddy	H. Glen Priddy
Lincoln	Ed. S. Leverton	Edith Bowman, Adam Wall
Riley	Everett Goshorn	Lucile Fogwell, Edward Pinkerton
JASPER (Edmund H. Denning, Supt.)		
Jasper Public	Claude Miller	Tillie Buechlein
KOKOMO (C. V. Haworth, Supt.)		
Central	James L. Cue	Margaret Bonifield, Mary Byers
Columbian	H. E. Adams	Fern Shenk
Douglass	H. A. Perry	H. T. Terry
Jefferson	John Wilson	John Wilson, Asenath Hunter
Lincoln	John Miller	Mae Reider
McKinley	C. O. Hoover	Esther Stockberger
Meridian	H. W. Van Denbark	W. B. Childers, Miriam Rich, Emma Scheidt
Palmer	C. O. Hoover	Mabel P. Mower
Riley	Raymond W. Holmes	R. W. Holmes, Jesse Fraling, Flora Martin
Roosevelt	Haines W. Sleeth	Mary E. Cedars
Washington	O. I. Farmer	Louise Smith
Willard	H. E. Adams	Bernice Johnston
LA GRANGE (Z. R. Le Master, Supt.)		
La Grange	Z. R. Le Master	G. R. Plusterer
LEBANON (Thomas L. Christian, Supt.)		
Central	Dorothy Stephenson	Hortense Smith
Julia N. Harney	Ethel Orear	Ray E. Hunter
Stokes	Grace Humphreys	——— Cline
MADISON (E. O. Muncie, Supt.)		
Eggleston	Marion S. Einsel	Marion S. Einsel, Margaret Bird
Lydia Middleton	Mary E. Wallace	Mary Christman, Myrn Davis
MARTINSVILLE (J. C. Rice, Supt.)		
Central	Oftie Greer	Oftie Greer, Sylvia Smith
North	Homer H. Terrell	Homer H. Terrell
South	Harold Bales	Harold Bales
MONTICELLO (F. H. Gillespie, Acting Supt.)		
Lincoln Grade	James W. Dyer	Eva Houston
West Building	James W. Dyer	Corabel Curtis
MT. VERNON (O. Stoy Hedges, Supt.)		
Central	Edward A. Pence	Rudolph Kruse, Ellen Nolte
MUNCIE (H. B. Allman, Supt.)		
Blaine Elementary	Omer M. Mitchell	Edward A. Olsen
Emerson	James L. Zedekar	Vecil Pittenger
Forest Park	Lyell Bussell	Lyell Bussell
Garfield	A. D. Johnson	Paul Malicote, Bertha Watson
Harrison	J. S. Shepard	Edna Garrett, Genevieve Hanna
Jefferson	Harrold Wallace	Ellen Cole, Lewis D. Kinsey
Lincoln	Chas. E. Lykins	H. Earl Browning, Adda Parsons
Longfellow	H. O. Lanning	Clyde A. Albin
McKinley Elementary	John S. Walker	D. Wilber Andrews
Riley	Harold Anderson	Harold Anderson, Ruth Fox
Roosevelt	Earl Peckinpaugh	Ava M. Fridley
Washington	Rosa Burmaster	Emily McCarty, Dougan Whybrew

TABLE I—CONTINUED

School	Principal	Teachers
NAPPANEE (J. A. Abell, Supt.)		
Central	G. C. Roose	Florence Allmann, Russell O'Neal, Miriam Stump
NEW CASTLE (R. H. Valentine, Supt.)		
Benj. S. Parker	Mary A. Harvey	Mary A. Harvey
Chas. S. Hernly	Wes L. Bouslog	Wes L. Bouslog
Holland	Bertha Scotten	Bertha Scotten
James C. Weir	Elizabeth Dingle	Elizabeth Dingle
Omar Bundy	Forrest Ritchie	Forrest Ritchie
NORTH VERNON (C. E. Sandefur, Supt.)		
North Vernon Elementary	V. M. Finchum	V. M. Finchum, Harold Hale, Pearl McConnell
PERU (J. P. Crodian, Supt.)		
Central	Paul Deer	Paul Deer
Elmwood	R. Clyde Hoppes	R. Clyde Hoppes, Merrill Conner
Grant	R. Clyde Hoppes	Bernice Brackett
Holman	R. G. Long	R. G. Long
Lincoln	F. O. Sonafrank	F. O. Sonafrank
South Peru	Mark Murfin	Mark Murfin
PETERSBURG (J. B. Leas, Supt.)		
Petersburg Public	C. D. Manhart	Elsaleah Miller, Regina Miller
PORTLAND (D. S. Weller, Supt.)		
General Shanks	R. S. Brubaker	R. S. Brubaker
Judge Haynes	Ralph D. Trotter	Arthur Michael
Lincoln	Susanne Goslee	Susanne Goslee
REDKEY (E. S. Castor, Supt.)		
Redkey Public	E. S. Castor	Garold Simons
RENSSELAER (R. L. Cleaveland, Supt.)		
Lincoln Grammar	Forrest Terrell	Forrest Terrell, Iris Berry, Holt Williams
ROCHESTER (Fred W. Rankin, Supt.)		
Columbia	K. V. Jones	K. V. Jones, Frank Graham
Lincoln	George Riddle	George Riddle, Otto Beehler
ROCKPORT (Frank A. Ross, Supt.)		
Seminary High School		Lorena Craig
RUSHVILLE (L. A. Lockwood, Supt.)		
Belle Gregg	Kenneth L. Fields	Kenneth L. Fields
Graham Annex	Myrtle Standiford	Myrtle Standiford
Havens	Helen Pierson	Grace Banta
SHELBYVILLE (W. F. Loper, Supt.)		
Booker T. Washington	Walter S. Fort	Walter S. Fort
Charles Major	Willard J. Day	Willard J. Day, Goldie Lemasters
Colescott	Wray Orem	Nelson Castle, Gladys Humphries
Thomas Hendricks	H. B. Kysar	H. B. Kysar
SOUTH BEND (Frank E. Allen, Supt.)		
Benjamin Franklin	C. M. Harris	Mildred Heckman
Benjamin Harrison	L. D. Waid	A. R. Kinsey, Mossie Weaver
Colfax	May Reynard	H. Ellison, Marilouise Kreidler
Elder	C. M. Harris	C. A. Fegan
Henry Studebaker	Crissie Reimold	Lawrence McKinney, Selma Pierson
James Madison	Lillian Anderson	Myrtle Swanson
James Monroe	Minnie Suchanek	LaVaughn Boulden, Gertrude Carlson
John F. Nuner	W. A. Butcher	Agnes Meyer
Kaley	Margaret Alexander	Anna Mohler, Anna Myers
Lincoln	Julia C. Malone	Lulu Jaquith
Linden	May Reynard	Ethel Carter, Chloe Sellers
McKinley	George R. Lambert	Nobel Fredrick
Marquette	Margaret Alexander	Vivian Hollopeter, Esther Kendrick
Muessel	J. C. Brumbaugh	Ruth Segety

TABLE I—CONTINUED

School	Principal	Teachers
Oliver	Byron C. Kirby	Hazel Calvert, Lulu Young
Perley	George R. Lambert	Lillian Johnson, Myron Weldy
Thomas Jefferson	Elmer E. Cook	Mildred Stover
Washington	F. O. Schoeppel	Mayme Kerner
SULLIVAN (Dale C. Billman, Supt.)		
Gymnasium	H. E. St. Clair	H. E. St. Clair, Jeanette Wernz
VEVAY (Austin T. Funk, Supt.)		
Vevay Elementary	Herbert Wakefield	Herbert Wakefield
WABASH (Owen J. Neighbours, Supt.)		
Century	Jessie Harris	Jessie Harris
East Ward	Kathryn Troxel	Kathryn Troxel
Miami	Frances Lynn	Frances Lynn, Jean Milliner
South Side	Frances Goodwin	Frances Goodwin
West Ward	Ertha Aukerman	Ertha Aukerman
WASHINGTON (Clyde Parker, Supt.)		
South Side	Sidney Carnahan	Amanda Colbert
Walnut Street	Ralph H. Smith	Ralph H. Smith
West End	W. H. Myers	Margaret Kauffman
WHITING (W. W. Borden, Supt.)		
Primary-McGregor	C. Ross Snapp	Jane White
South Side	R. A. Dougherty	R. A. Dougherty
WINCHESTER (Philip M. Wesner, Supt.)		
Frances E. Willard	Russel Porter	Russel Porter
Oliver P. Morton	John Kidder	John Kidder
COUNTY		
BOONE (Paul W. Nicely, Supt.)		
Advance	Russell Landreth	Edna Jones
Buntin		Florence Jones
Center No. 1		Gladys Riggins
Center—		
Marion Township		Ernest Peters
Center Ridge		Sadie Galvin
Dover	Paul J. Swank	Edith Debard
Elizaville		Beulah Swope
Hopewell		Neva Swinford
Jamestown	Russell Landreth	Marjorie Mercer
Julius Pinnell	Earl Poer	Earl Hendricks
Lindbergh	Wayne Black	Helen Copeland
Perry Central	Harold J. Rarick	Serelda Smith
Terhune		Earl Freeman
Thorntown	J. Ord Fortner	Evelyn Reed
Union Township	Mente Sharr	Agnes Cory
Washington	Baxter Reed	Fern Millikan
Whitestown	Everett Ebbertt	Naomi Beck
Zionsville—		
Eagle Township	George W. Davis	Verne Moore
CLINTON (Chas. L. Hawkins, Supt.)		
Beard		Roy Whiteman
Colfax	Simon H. Irick	Grace D. Parker
Forest Township	Owen Mitchell	Beatrice V. Batts
Jackson Township	C. M. Spall	Helen McKinney
Kirklin	Ira W. Conner	Jeanette Collier
Michigantown	W. B. Reed	Winifred Kinsler
Middlefork		Mabel Hughes
Mulberry	Chas. C. Jones	Marjorie K. Ruch
Owen Township	Lewis A. Jones	Richard Cox, Eva M. Need
Rossville	Lawrence Hobbs	Helen P. Marshall
Scircleville	Otto Dick	J. V. Wood
Scroggy		Jennie Black
Washington Township	James C. McBride	Dorris Coupland
DAVIESS (David H. Carter, Supt.)		
Cannellburg	William Donahue	Walter Downey
Elmore Township	Leo J. Baker	Searle A. Bridwell
Jefferson	D. D. Williams	D. D. Williams, Gladys Greenwood

TABLE I—CONTINUED

School	Principal	Teachers
Longfellow	Clifford Doades	Clifford Doades, Margaret Williams
Montgomery—		
Barr Township	Joseph M. Friedman	Florence Smith
Sugarland	E. E. Meade	Norabel W. Barber
DEARBORN (Joseph R. Houston, Supt.)		
Colfax		Blanche Tibbetts
Dillsboro	Forest Caldwell	Roscoe Riggins
Ester Ridge		Myrtle Shanks
Greendale	J. C. Senitza	La Ree Alexander, Helen Cann
Harrison Township		Amelia L. Sherman
Homestead	Margaret Bolling	Margaret Bolling
Lawrenceville		Margaret Hazen
Leineigar		Isobel Weber
Manchester		Robert W. Lusk
Plum Point		Isola Rumsey
Todd		Verle Rumsey
Wilmington		Irma Thieman
Wrights Corner		Robert McMullen
ELKHART (B. J. Stump, Supt.)		
Concord Township		
Departmental	Kenneth Zook	Ernest Miller
Concord Township		
East Side	Christine Logan	J. Claire Kauffman
FOUNTAIN (Forrest R. Groff, Supt.)		
Covington Elementary	Elizabeth McDonald	Elizabeth McDonald, Jesse De Haven
FULTON (S. Earl Rouch, Supt.)		
Akron	Richard Knarr	Nadine Sriver
Burton	Kermit Biddinger	Jane Kemper
Delong		Paul Hoover
Fulton	Dwight Gallipo	Raymond L. Cook
Grasscreek	Everett Strycker	Dorothy Grossman
Kewanna	Wayland Richardson	Raymond Cook
Leiters Ford	Bruce Abernathy	Dorothy Smith
Reiter	Fred Van Duyne	Bertha Lynn
Richland Center	John R. Wagoner	Lloyd Beehler
Talma	Mack Tucker	Ruth Keebler
Woodrow	Clifford Baggerly	Isabelle Rans
HAMILTON (John S. Hussey, Supt.)		
Boxley	Lu Ray Pickett	Lu Ray Pickett, Joyce Cline
HANCOCK (S. Ralph Boring, Supt.)		
Brandywine	Fred Passwater	Beverly Montrose
Charlotteaville	Grover Van Duyn	Doris Bell
Eden	John Blacker	Lois Humfleet
Fortville	Victor Owens	Edna Leonard
McCordsville	Emil Mills	Lavonne Huff
Maxwell	O. C. Harrell	Lola Bradley
Mt. Comfort	Geo. B. Glenn	Fern Cathey
New Palestine	F. A. Wheeler	Minnie Wheeler
Shirley	Ruth Maines	Ruth Maines
Westland	Chas. E. Patton	Pearl Cox
Wilkinson	R. M. Reynolds	Mildred Hedrick
HENDRICKS (Jewell H. Vaughan, Supt.)		
Amo	J. E. Stewart	J. E. Stewart
Coatesville	J. E. Stewart	J. E. Stewart
Plainfield Elementary	Merrit Williams	Merrit Williams, Mary Hagee
JAY (Lawrence L. Steed, Supt.)		
Bluff Point		Jesteen Gegenheimer
Bryant	Crate Beck	Wanda Hildreth
Center		Grace A. DeHaven
College Corner		Ralph Messner
Collett (Pike Township)		Sharon L. Finch
Gibson		Bernadine Nonte
Gov. I. P. Gray	Dallas Albright	Zenobia Thomas
Greenhill		Garnet Stullen
Madison Township	J. D. Sarig	Ivan A. Summer
Miller		
(Wayne Township)		Clifford Simons

TABLE I—CONTINUED

School	Principal	Teachers
New Corydon		Beulah M. Leahey
Noble Township	Frank Cline	Madonna Miller
Pennville	John W. Reynolds	Delight Craig
Poling	Grant Cooper	Marion Ninde
Salamonia		Mabel Schlechty
Swamp Hollow		Harriet May
Walnut Corner		Delight Hall
Zoar		William F. Ashby
LA GRANGE (Howard W. Yoder, Supt.)		
Bloomfield Graded	Guy R. Hall	Berniece Miller
Brighton	Shelly Caldwell	Muriel Sayles
Green		Ethelyn Davis
Honeyville (Eden Township)	Le Roy Yoder	Virginia Yoder
Lima	Lawrence Sayles	Volga Caton
Mongo (Springfield Township)	W. B. Sturgis	A. B. Cookerly
Pashan		Helen Mishler
Poynter		Ralph Kline
Sand Hill		Bernice Goodwin
Saylor		Thyra Gay
Scott	William C. Gohl	Rufus Christner
South Milford	Kenneth Williams	Mary Kennedy
Stroh	James Smith	James Smith
Taylor		Cornell Price
Topeka	Wilbur Eshelman	Gladys Swartz
Walnut		Nellie Rohrer
Wolcottville	Harry Kinsey	Ethel Brumbaugh
Wortinger		Alvin Ebersol
Yoder		Amos Hostetler
MARION (Harvey F. Griffey, Supt.)		
Ben Davis Grade	Ancel G. Lewis	Catherine McBurney
Cumberland	Gertrude Patterson	Fannie Ostermeyer, Louise Riser
Drexel Gardens (13)	Chas. T. Borchers	Ina Irman, Betty Lou Peterson
Fleming Garden	Madison Shadley	Leona Axsom
Franklin Township	Omer Smith	Kathryn McCollum
Garden City	Hershel Whitaker	Ethel Lentz
Lowell	Lucille Sutherland	Harold Kohlmeyer
Pleasant Run	C. V. Miller	C. V. Miller
Shadeland	Gertrude Bank	I. V. Dowden, Grace Wright
Township House	Jean Wampner	Emma A. Masten
OWEN (James Albert Free, Supt.)		
Spencer Elementary	Wilhelmina Shively	Alma Evans, Juel Free
PERRY (Fred J. Evrard, Supt.)		
Avery		Amy Brunner
Branchville		Gladys Hoover
Bristow	Arthur Pierrard	Harold Rickenbaugh
Burr		Victor Gibson
Derby (Union Township)		Russell Badger
Dexter		Earl Etienne
Elder		Archie Henrickson
Howell (Anderson Township)		Adah Winchell
Howell (Union Township)		Walter Gaither
Kitterman		Henry Aders
Leopold		J. V. Devillez
Oil Township Consolidated	Edward Evrard	Hascal N. Greiner
Oriole		Anna Little
Rome		J. Leonard Glenn
St. Croix		Clyde LaGrange
Theis		Elizabeth Lehm-Kuhler
Tobinsport		Willa May Weatherholt
Troy	Mary C. Burke	William D. Rust
Troy Township Consolidated	Leonard Hall	Edward Henning
PORTER (M. Earl Dinsmore, Supt.)		
Beverly (Pine Township)		Floyd Shunk
Boone Grove	M. Ray Alishouse	Florence Moore
Carver (Pine Township)		Jewell A. Wingert
Chesterton Grade	Edgar Bergquist	Edgar Bergquist

TABLE I—CONTINUED

School	Principal	Teachers
Cook's Corners	Glenn Kinne	Mary Trudelle
Flint Lake	Gayle A. Coplin	Gayle A. Coplin
Garyton	Jesse Ripperdan	Jesse Ripperdan
Hayes-Leonard	Gladys K. Swartz	Gladys K. Swartz
Hebron	M. M. Hague	Doris Morrow
Jackson Township	George K. Lowry	Berniece Beach
Kouts	Chas. C. McMurtry	Loretta Lauer
Morgan Township	Floyd O. Glass	Isla Lembke
Portage Township	Leroy C. Hoff	Frances Horner
Porter Grade	O. J. Betterton	O. J. Betterton
Washington Township	Jay E. Waskom	Sadie J. Miller
Wheeler (Union Township)	Wallace Aylesworth	Mabelle Keene
ST. JOSEPH (Otto J. Newman, Supt.)		
Boner	Marvin Bolin	Marvin Bolin
Centre Township Elementary	Homer Stomm	Homer Stomm
Crumstown	Ruth J. Fero	Richard Whitmer
Fulmer	Howard Moon	Ivo E. Marker
Kennedy	Clayton E. Felton	Richard Hesch, Mildred Needler
Lakeville Elementary	J. Wilbur Kolb	J. Wilbur Kolb, Dawson W. Ritter, Thelma Waite
SHELBY (Thomas Fogarty, Supt.)		
Addison Township	Blanche Mount	Letha Hendrickson
Boggstown	F. R. Garver	Rosamund Page
Fairland	Floyd L. Harrell	Frances Compton
Flat Rock	Charles Wetzel	Frances Cochran
Hendricks Township	Samuel Sandefur	Elva Thurston
Jericho		Mildred Fuchs
Marion Township	Katherine Lowden	Irene Ross
Morristown	S. R. Lamb	C. N. Moore
Mt. Auburn	Robert Gossett	W. O. Isley
Noble Township Consolidated	Redden Patterson	Mark C. Rick
Shelby Township	Gerald Carmony	Frances Thompson
Union Township	Ralph John	Ruth Phares
Waldron	Loren H. York	Dorothy Wasson
WARREN (Luther B. Mann, Supt.)		
Foster		J. W. Sisk
Green Hill	Harold Dotson	Harold Dotson
Hedrick		Mary Miller
Independence		Charles L. Cavanaugh
Judyville	Jean Johnson	Virginia Nolin
Kramer	Alora Clem	Alora Clem
Locust Grove		Gladys Larch
Marshfield	Hobart L. Allen	Hobart L. Allen
Pence		H. W. Willen
Pine Village	Willis Adams	Lena C. Rhode
Rainsville	Elba Brown	Freda Jackson
Smith		Pearl Hipsher
Tab Grade	Ormand M. Bailey	Ormand M. Bailey
West Lebanon	Otho Hogue	Oma Highfill
Winthrop		Lulu Chickadaunce
WELLS (Wayne Lee, Supt.)		
Chester Center	Huber Settle	Delmar Harrold
Jackson Township	Gerald Irwin	Ruth W. King
Petroleum	Earl Chandler	Lester Reynolds
Poneto	Harold E. Foust	Harold E. Foust
Poplar Grove	Eldon Carnes	Carrie Day
Rockcreek Center	Mark Brumbaugh	Clive I. Murkley
Union Center	Horace Bosler	Robert Fetterhoff, E. McLeon
Vera Cruz	Noah E. Wall	Noah E. Wall
SPECIAL		
BLACKFORD COUNTY (Fred F. Glancy, Supt.)		
Montpelier and Harrison Township Joint (H. G. Morgan, Supt.)		
Elementary	M. A. Wilson	Charles Anthony, O. R. Cline
BLOOMINGTON (H. E. Binford, Supt.)		
University	Harold E. Moore	Caroline Wildrick
CRAWFORD COUNTY (Shelby C. Adams, Supt.)		
Milltown and Whiskey Run Township (Orin E. Flinn, Supt.)		
Elementary	Ollie T. Bosse	Kathryn Bosse

TABLE I—CONTINUED

School	Principal	Teachers
DAVIESS COUNTY (David H. Carter, Supt.)		
St. Peters	Sr. M. Patricia Tuttle	Sister M. Patricia Tuttle
DEARBORN COUNTY (Joseph R. Houston, Supt.)		
Dover St. John		Sister Dorine Tebbe
Guilford Consolidated	John C. Corn	Florence V. Darling
St. Johns Lutheran		Edward H. Singer
St. Joseph (St. Leon)		Sister M. Alice Raymond
St. Martin (Yorkville)		Sister Dorothy Marie
St. Paul		Sister M. Antonia Schmitz
West Harrison		Bernard Losekamp
DEKALB COUNTY (Carl F. Stallman, Supt.)		
Butler (John Paul Price, Supt.)		
FRANKLIN (Ralph W. Sheek, Supt.)		
Masonic Home Grade	Clara Lambert	Clara Lambert
GARY (Charles D. Lutz, Supt.)		
Holy Trinity		Sister M. Camilla, Sister Lucilla
GIBSON COUNTY (M. A. Massey, Supt.)		
Oakland City-Columbia Township Consolidated (Waldo J. Wood, Supt.)		
Elementary	William E. Green	Dennis Grubb, Forrest Morris
GRANT COUNTY (Fred Ratliff, Supt.)		
Fairmount and Fairmount Township (F. Stanton Galey, Supt.)		
North	Arthur Payne	Esther Jay, Martha J. Young
West	India U. Nose	India U. Nose
HENRY COUNTY (Don Edington, Supt.)		
Middletown and Fall Creek Township (C. R. Young, Supt.)		
Central	H. Ross Jackson	H. Ross Jackson
JASPER (Edmund H. Denning, Supt.)		
St. Joseph		Sr. Marie Angela, Sr. Joseph Anne, Sr. Mary Gabriel
LAWRENCEBURG (George W. McReynolds, Supt.)		
St. Lawrence		Sister M. Eulalia
ORANGE COUNTY (Orville E. Cornwell, Supt.)		
French Lick (Harvey Laughlin, Supt.)		
Elementary	A. E. Pershing	Herschel J. Gasaway
PERRY COUNTY (Fred J. Evrard, Supt.)		
Siberia		Sister M. Beatrice Brames
St. Marks		Sister M. Benigna Stallman
St. Michael		Sister M. Domitilla
St. Pius		Sister M. Germaine
ST. JOSEPH COUNTY (Otto J. Newman, Supt.)		
Walkerton-Lincoln Township (J. M. Sellers, Supt.)		
Elementary	Guy G. Sharp	Elsie Steele, Grant Steele
SCOTT COUNTY (Clinton H. Gamble, Supt.)		
Scottsburg-Vienna Township Joint (W. L. Craig, Supt.)		
Elementary	Vaughn Shoemaker	Bernice D. Luckey
SULLIVAN COUNTY (Jesse M. Boston, Supt.)		
Carlisle-Hadden Township (P. R. Cromwell, Supt.)		
Elementary	H. W. Gross	——— Miller, ——— Gore
UNION COUNTY (William N. McMahan, Supt.)		
Liberty Center Township (J. J. Turner, Supt.)		
Elementary	Harold Michel	Harold Michel
WAYNE COUNTY (Arthur H. Hines, Supt.)		
Cambridge City and Jackson Township (Floyd A. Hines, Supt.)		
Central	Anthony Milanovich	Anthony Milanovich, Nina Kirkham
Dublin	O. B. McCullough	O. B. McCullough
Pershing	Eli Walls	Eli Walls

in some of the schools arithmetic was departmentalized. Individual teachers were not always listed in departmentalized schools; therefore the exact number of sixth grade teachers participating in the study cannot be accurately stated, but there were approximately 600.

Data for 6A pupils were received from 6,407 pupils enrolled in 190 city schools, 2,993 pupils in 199 township schools, and 802 pupils in 32 special schools. A total of 10,200 average scores were received from 421 schools. Data for 6B pupils were received from 944 pupils in 56 city schools, 207 pupils in 8 township schools, and 7 pupils in 1 special school—a total of 1,158 pupils in 65 schools.

The distribution of participating schools throughout the state is given in Figure 1. As shown in this figure, pupils from all areas of the state are included in the study.

A sample copy of the class record used in the study is shown in Figure 2. This record was devised by the committee, published by the World Book Company, and distributed with the test booklets to the participating schools. An examination of the record form shows the type and extent of the information secured. Besides asking for the usual information, including the pupil's name, sex, race, date of birth, and scores, and the name of the school, city or county, teacher, grade, and date of the examination, this record form also asks for length of the school term, number of rooms (elementary) in the building, number of grades in the room, number of minutes given each day and each week to the study of arithmetic, and the organization of the school (whether departmentalized or not). The committee deemed such information desirable for a complete analysis of the test results.

INDIANA SIXTH GRADE TESTING PROGRAM

ARITHMETIC — SOCIAL STUDIES

CLASS RECORD

School ..... City or County .....

Teacher ..... Date of examination .....

Grade 6B ..... Grade 6A .....

Length of school term in months .....

No. of rooms (elementary) in building .....

No. of pupils in class .....

No. of grades in room .....

No. of minutes given to Arithmetic per day .....; per week .....

No. of minutes given to Social Studies per day .....; per week .....

Departmentalized Arithmetic: Yes ..... No .....

Departmentalized Social Studies: Yes ..... No .....

Unified Course (History & Geography) .....

Separate Course (History & Geography) .....

NOTE. Send one copy of this record sheet to Dr. Merrill T. Eaton, Indiana University, Bloomington, Indiana, and keep one copy for your records.

Important. Norms: Use **Modal-Age Norms**, Table 3, page 6, of the Directions for Administering the Arithmetic Tests or Table 3, page 8, of the Directions for Administering the Social Studies Tests.

Pupil's Name	SEX		RACE	DATE OF BIRTH			ARITHMETIC						SOCIAL STUDIES					
							COMPUTATION		REASONING		AVERAGE		I		II		AVERAGE	
	Boy	Girl		Mo.	Day	Year	Equivalent Score	Grade Equivalent	Equivalent Score	Grade Equivalent	Equivalent Score	Grade Equivalent	Equivalent Score	Grade Equivalent	Equivalent Score	Grade Equivalent	Equivalent Score	Grade Equivalent
1																		
2																		
3																		
4																		
5																		
6																		
7																		

FIG. 2. RECORD FORM USED IN COLLECTING DATA FOR THE STUDY

As soon as the participating schools had scored their tests and entered their data on the record forms, they mailed the forms to the Bureau of Cooperative Research and Field Service, Indiana University, for processing. The record sheets were carefully inspected and any errors in the transmittal of equated scores to grade equivalents were corrected. If there were any questions concerning the data, a letter was addressed to the school in question, asking for the desired information. The data were then coded, the results punched on Hollerith cards, and the cards processed. Throughout this study, schools are referred to by code number and not by name. Each participating school has been informed of its code number and has received a summary of the results of the study throughout the state.

RESULTS

The Stanford Intermediate Arithmetic Test was given to 10,200 6A and 1,158 6B pupils, a total of 11,358 pupils enrolled in 486 elementary schools in Indiana. All but a few of the tests were given during the period from April 16 to May 15, 1943. A small number of pupils were tested either a few days before April 16 or a few days after May 15, but these few pupils were tested so close to the period assigned that all testing is considered as being done during the dates given. Of the schools included in this survey, 175 had a term of 8 months, 11 a term of 8½ months, 199 a term of 9 months, 14 a term of 9½ months, and 22 a term of 10 months.

The Stanford Intermediate Arithmetic Test is an 8-page booklet including two separate tests, arithmetic computation and arithmetic reasoning. Three scores are derived—a computation score, a reasoning score, and an average of these two scores. Raw scores are translated into equated scores that are comparable for the two tests, and grade equivalents corresponding to these equated scores are also given in the manual.[1] The modal-age-grade equivalents, which are based upon the scores of pupils at the grade for their age, are used rather than the traditional type age-grade equivalents. By this method the effect of retardation and acceleration is eliminated in determining norms. The grade equivalents corresponding to a given score represent the grade level for which that grade would be average in a population from which the effects of retardation and acceleration have been eliminated.

Grade placements corresponding to testing dates are also given in the manual.[1] The norm grade equivalent for the 6A pupils tested in this study is 6.8 years, and for the 6B pupils, 6.3 years, since the tests were given during the period from April 16 to May 15. An equated score of 60 is equivalent to the norm grade equivalent of 6.8 years for the 6A and an equated score of 57.5 equals the grade equivalent norm of 6.3 years for the 6B.

The results obtained when the test was given to 6B pupils are treated separately from those obtained when it was given to 6A pupils.

[1] Stanford Achievement Test, Directions for Administering, World Book Co., New York, 1941.

Data Concerning Individual Schools

In Table II, data are organized by school, according to the type of school—city, township, and special. Within each type, the schools are listed numerically by code number. The number of sixth grade pupils tested in each school, the mean of the equated scores for the group in arithmetic computation, arithmetic reasoning, and arithmetic average, the corresponding grade equivalents, the deviation of the group from the norm, and the distribution of pupils in relation to the average are given in the table. Individual pupil scores are too voluminous to include in this publication. Norms for each type of school—city, township, and special—are given, as well as those for all pupils in each type.

An arbitrary method was devised for the study of the distribution of pupils in relation to the test norm. A 6A student was considered average if he had a grade equivalent within four months of the norm (6.8 years), that is, if his grade equivalent fell within a range of 6.4 years to 7.2 years inclusive. A pupil was considered 1 year accelerated if his grade equivalent was within the range from 7.3 years to 8.2 years inclusive; 2 years accelerated if it fell within the grade equivalent range from 8.3 years to 9.2 years inclusive; and 3 years or more accelerated if it was 9.3 years or higher. He was considered 1 year retarded if his grade equivalent fell within the range from 5.4 years to 6.3 years inclusive; 2 years retarded if it fell within the range of 4.4 years to 5.3 years inclusive; and 3 years or more retarded if it was 4.3 years or lower.

A 6B pupil was also considered average if he had a grade equivalent within four months of the norm (6.3 years), that is, if his grade equivalent fell within a range of 5.9 years to 6.7 years inclusive. A pupil was considered 1 year accelerated if his grade equivalent fell within the range from 6.8 years to 7.7 years inclusive; 2 years accelerated if it fell within the range from 7.8 years to 8.7 years inclusive; and 3 years or more accelerated if it was 8.8 years or higher. He was considered 1 year retarded if his grade equivalent fell within the range from 4.9 to 5.8 years inclusive; 2 years retarded if it fell within the range from 3.9 years to 4.8 years inclusive; and 3 years or more retarded if it was 3.8 years or lower.

In analyzing the achievement of a sixth grade group in computation, reasoning, and arithmetic average, the average grade equivalent of the group was compared with the test norm. If the mean grade equivalent of the school was above the test norm, the degree of deviation was marked + (plus); if below, it was marked — (minus). The distribution of pupils was studied in relation to the number of pupils who made average scores and the spread of those who were above or below average.

The average grade equivalent of a group is not always a good measure of the group because a few pupils testing exceptionally high or exceptionally low will change the average to such an extent that it is not representative of the group. However, when the average grade equivalent is considered in connection with the distribution of

the pupils in the group, a fair and accurate evaluation of the group may be made.

Scores for 10,200 6A pupils and 1,158 6B pupils are given in Table II. The 6B data follow those of the 6A and are separate from them. The data in this table are easy to read and understand. In school 10601, 50 pupils were tested in arithmetic computation. The mean equated score for the group was 67.0 and the corresponding grade equivalent was 8.3, which is 1.5 above the test norm. Therefore the group deviation from the norm was +1.5. The distribution of scores was not a normal distribution. Nine pupils made an average score, 12 were accelerated 1 year, 7 were accelerated 2 years, and as many as 17 were accelerated 3 years or more, while only 5 pupils were retarded and only 1 of these was retarded as much as 2 years. There were also 50 pupils tested in arithmetic reasoning. These pupils made an average equated score of 63.3 and a corresponding grade equivalent of 7.4 years, which is .6 years above the test norm. The group was less efficient in arithmetic reasoning than in arithmetic computation. The distribution of scores in reasoning was more normal than that in computation, but was still somewhat skewed to the right. One pupil was 3 or more years retarded, 4 were 2 years retarded, 11 were 1 year retarded, 7 were average, 6 were 1 year accelerated, 10 were 2 years accelerated, and 11 were 3 or more years accelerated. When the distribution of pupils in arithmetic reasoning is compared with the distribution in arithmetic computation, it is clear that the higher grade equivalent in computation was due to the fact that 36 of the 50 pupils were above average in computation while only 27 were above average in reasoning. The average equated score of these pupils on the test as a whole was 65.4 with a corresponding grade equivalent of 7.8, which is exactly 1 year above the test norm. This group, therefore, tested equal in achievement in arithmetic average to a normal seventh grade group. Nine of the 50 pupils in the group were average and only 9 were below average, there being as many as 32, or 64 per cent, above average.

It will be noted that the number of pupils tested was not always the same for arithmetic computation, arithmetic reasoning, and arithmetic average. This is due to the fact that in many schools the two tests were given on different days and in some cases pupils were absent for one of the tests. Sometimes, when a pupil took one of the tests but not the other his arithmetic average was sent as the score made on the test taken; at other times no average arithmetic score was was given. In all cases such test scores were processed as entered by the teacher on the record form.

There is much more of interest in the data in Table II than space will permit for discussion, but it seems worth while to point out a few interesting cases. Some schools tested well below the test norm; some equaled the test norm; and some tested well above. School 13810 is an example of a city school testing well below the test norm. The 33 pupils in this group made an average equated score in arithmetic computation of 41.6 with a corresponding grade equivalent of 4.4 years, which is 2.4 years below the test norm. Sixteen of the

TABLE II. NUMBER OF PUPILS IN EACH SCHOOL, MEAN SCORES, GRADE EQUIVALENTS, DEVIATION FROM THE NORM, AND DISTRIBUTION OF SCORES AROUND THE AVERAGE

School	Arithmetic computation												Arithmetic reasoning												Arithmetic average											
					Distribution												Distribution												Distribution									
	N	M	GE	D	−3	−2	−1	A	+1	+2	+3		N	M	GE	D	−3	−2	−1	A	+1	+2	+3		N	M	GE	D	−3	−2	−1	A	+1	+2	+3		
6A PUPILS CITY																																				
10601....	50	67.0	8.3	+1.5	0	1	4	9	12	7	17		50	63.3	7.4	+ .6	1	4	11	7	6	10	11		50	65.4	7.8	+1.0	0	1	8	9	12	7	13	
10602....	24	62.4	7.2	+ .4	0	2	1	8	6	6	1		24	67.3	8.3	+1.5	0	2	4	2	1	3	12		24	66.2	8.1	+1.3	0	1	3	5	2	5	8	
10801....	23	52.7	5.6	−1.2	4	6	2	2	3	2	4		23	54.4	5.8	−1.0	6	4	1	2	2	3	5		23	54.4	5.8	−1.0	5	5	2	0	2	6	3	
10901....	48	63.3	7.4	+ .6	0	0	10	14	10	6	8		48	63.7	7.6	+ .8	0	0	9	14	7	12	6		48	63.6	7.6	+ .8	0	0	8	16	8	9	7	
10903....	30	62.5	7.4	+ .6	0	0	9	8	6	2	5		30	60.6	7.0	+ .2	0	4	6	9	3	6	2		30	61.4	7.0	+ .2	0	0	9	7	7	6	1	
10904....	36	64.0	7.6	+ .8	1	1	7	7	5	6	9		36	59.1	6.6	− .2	1	7	9	5	7	3	4		36	62.3	7.2	+ .4	1	4	8	5	5	7	6	
10905....	15	56.0	6.1	− .7	3	0	2	3	4	2	1		15	50.1	5.2	−1.6	3	1	7	3	1	0	0		15	53.2	5.6	−1.2	3	1	2	6	2	1	0	
11101....	30	66.1	8.1	+1.3	0	0	0	8	8	10	4		30	68.7	8.8	+2.0	0	1	2	0	4	12	11		30	67.1	8.3	+1.5	0	0	1	3	8	11	7	
11301....	26	66.7	8.3	+1.5	0	2	4	2	1	4	13		26	66.7	8.3	+1.5	1	2	1	4	1	5	12		26	66.4	8.1	+1.3	0	2	3	3	2	4	12	
11402....	28	55.4	5.9	− .9	1	6	12	5	1	1	2		28	55.2	5.9	− .9	2	9	5	5	2	3	2		28	55.1	5.9	− .9	3	7	6	7	2	1	2	
11404....	34	48.7	5.1	−1.7	6	6	18	3	1	0	0		34	52.0	5.5	−1.3	6	6	14	4	1	2	1		34	50.0	5.2	−1.6	8	6	14	3	2	1	0	
11405....	40	52.1	5.5	−1.3	2	13	19	3	3	0	0		40	50.5	5.4	−1.4	3	21	10	3	1	0	2		40	51.0	5.4	−1.4	2	14	18	4	0	2	0	
11701....	10	61.8	7.2	+ .4	0	0	3	3	1	2	1		10	63.2	7.4	+ .6	0	0	2	4	1	2	1		10	62.1	7.2	+ .4	0	0	1	5	2	1	1	
11703....	55	64.9	7.8	+1.0	1	2	6	9	8	17	12		55	64.9	7.8	+1.0	1	2	7	9	10	11	15		55	65.1	7.8	+1.0	0	4	4	8	14	11	14	
12301....	68	57.6	6.4	− .4	3	8	21	19	10	6	1		68	58.5	6.6	− .2	3	12	17	7	9	14	6		68	58.2	6.4	− .4	4	7	18	11	17	10	1	
12401....	48	63.1	7.4	+ .6	0	1	6	17	10	9	5		48	66.9	8.3	+1.5	0	1	7	6	8	6	20		48	65.0	7.8	+1.0	0	0	5	11	13	9	10	
12502....	13	65.8	8.1	+1.3	0	0	1	3	1	5	3		13	63.5	7.6	+ .8	0	0	2	3	3	4	1		13	64.8	7.8	+1.0	0	0	1	2	5	4	1	
12503....	18	58.4	6.4	− .4	0	1	8	4	2	2	1		18	59.5	6.8	0	1	1	5	4	2	4	1		18	58.9	6.6	− .2	0	1	7	6	1	3	0	
12504....	56	62.2	7.2	+ .4	0	1	6	14	5	7	3		36	63.7	7.6	+ .8	0	3	4	9	6	7	7		36	63.2	7.4	+ .6	0	1	4	15	4	6	6	
12505....	26	60.0	6.8	0	0	2	9	7	3	4	1		26	60.2	6.8	0	0	4	7	6	1	5	3		26	60.3	6.8	0	0	2	7	7	6	3	1	
12601....	59	63.6	7.6	+ .8	0	1	7	22	10	14	5		59	63.5	7.6	+ .8	0	4	11	10	10	13	11		59	63.3	7.4	+ .6	0	1	12	13	12	15	6	
12602....	34	64.1	7.6	+ .8	1	1	5	10	6	2	9		34	65.4	7.8	+1.0	0	3	6	4	4	5	12		34	64.6	7.8	+1.0	1	1	6	7	4	6	9	
12603....	26	56.5	6.2	− .6	0	5	11	5	3	2	0		26	58.3	6.4	− .4	1	7	4	3	3	7	1		26	57.2	6.2	− .6	0	4	9	5	6	2	0	
12604....	17	56.3	6.1	− .7	1	4	4	3	4	1	0		17	56.4	6.1	− .7	1	4	4	3	1	3	1		17	56.5	6.2	− .6	2	2	3	7	1	1	1	
12605....	10	62.7	7.4	+ .6	0	0	3	3	1	0	3		10	66.4	8.1	+1.3	0	0	1	3	2	0	4		10	64.4	7.6	+ .8	0	0	2	3	1	1	3	
12801....	57	62.3	7.2	+ .4	1	1	11	17	6	16	5		57	62.7	7.4	+ .6	4	5	8	4	8	14	14		57	62.5	7.4	+ .6	1	5	9	7	15	12	8	
12901....	13	59.5	6.8	0	0	2	2	4	3	1	1		13	55.0	5.9	− .9	1	3	5	2	1	0	1		13	57.6	6.4	− .4	0	1	5	6	0	0	1	
12902....	6	62.3	7.2	+ .4	0	0	2	1	1	1	1		6	63.5	7.6	+ .8	0	1	0	1	1	2	1		6	62.8	7.4	+ .6	0	0	2	1	1	1	1	
12903....	2	47.0	4.9	−1.9	0	2	0	0	0	0	0		2	49.0	5.1	−1.7	0	1	1	0	0	0	0		2	48.0	5.0	−1.8	0	1	1	0	0	0	0	
12904....	29	65.4	7.8	+1.0	0	2	2	4	6	8	7		29	63.5	7.6	+ .8	1	4	1	2	7	6	8		29	64.3	7.6	+ .8	0	4	1	3	8	6	7	

TABLE II—CONTINUED

School	Arithmetic computation											Arithmetic reasoning											Arithmetic average										
					Distribution											Distribution											Distribution							
	N	M	GE	D	−3	−2	−1	A	+1	+2	+3	N	M	GE	D	−3	−2	−1	A	+1	+2	+3	N	M	GE	D	−3	−2	−1	A	+1	+2	+3
16606....	24	64.8	7.8	+1.0	0	1	1	8	3	6	5	24	63.9	7.6	+ .8	1	0	5	6	1	4	7	24	64.7	7.8	+1.0	1	0	2	9	1	5	6
16607....	20	63.8	7.6	+ .8	0	2	1	4	4	7	2	20	59.2	6.6	— .2	2	1	5	4	2	4	2	20	61.7	7.2	+ .4	0	2	2	6	4	3	3
16608....	25	52.4	5.5	−1.3	2	7	12	2	1	1	0	25	55.0	5.9	— .9	1	9	4	5	2	3	1	25	54.0	5.8	−1.0	2	5	11	3	2	2	0
16609....	17	55.6	6.1	— .7	1	2	6	5	1	2	0	17	55.9	6.1	— .7	1	4	6	3	0	2	1	17	55.4	5.9	— .9	1	1	8	4	1	2	0
16610....	28	58.8	6.6	— .2	1	6	2	11	1	5	2	28	57.3	6.2	— .6	4	2	7	2	6	5	2	28	58.3	6.4	— .4	4	0	6	8	4	5	1
16611....	30	64.7	7.8	+1.0	1	0	4	6	5	8	6	30	65.2	7.8	+1.0	0	3	3	5	3	9	7	30	64.7	7.8	+1.0	0	1	4	5	7	7	6
16612....	11	52.6	5.6	−1.2	1	3	4	3	0	0	0	11	47.5	5.0	−1.8	2	5	2	0	1	1	0	11	50.3	5.2	−1.6	1	6	1	1	2	0	0
16801....	26	68.2	8.5	+1.7	0	0	1	5	3	10	7	26	64.1	7.6	+ .8	0	1	3	7	4	5	6	26	66.1	8.1	+1.3	0	0	1	6	9	5	5
17101....	25	69.6	9.0	+2.2	0	0	2	0	4	9	10	25	69.9	9.0	+2.2	0	0	1	4	3	4	13	25	70.0	9.0	+2.2	0	0	1	0	7	7	10
17102....	11	66.1	8.1	+1.3	0	0	2	2	3	1	3	10	62.9	7.4	+ .6	0	1	1	3	2	2	1	11	64.9	7.8	+1.0	0	1	0	3	3	3	1
17103....	18	70.7	9.3	+2.5	0	0	0	1	1	7	9	18	72.3	9.5	+2.7	0	0	0	1	1	5	11	18	71.9	9.5	+2.7	0	0	0	0	3	5	10
17601....	21	60.1	6.8	0	0	1	8	3	3	5	1	21	61.2	7.0	+ .2	6	2	7	3	4	2	3	21	60.8	7.0	+ .2	0	1	6	5	5	3	1
17602....	28	56.0	6.1	— .7	0	6	11	7	2	2	0	28	52.1	5.5	−1.3	2	12	5	7	2	0	0	28	54.0	5.8	−1.0	1	5	12	7	0	3	0
17801....	70	58.0	6.4	— .4	4	10	9	24	16	4	3	70	53.8	5.8	−1.0	10	12	20	15	6	6	1	70	56.0	6.1	— .7	6	10	20	16	13	4	1
17802....	36	60.8	7.0	+ .2	0	3	7	16	2	5	3	36	56.3	6.1	— .7	1	8	9	11	2	5	0	36	58.8	6.6	— .2	1	1	13	10	7	3	1
17803....	30	59.1	6.6	— .2	0	2	11	8	6	2	1	30	58.6	6.6	— .2	0	4	10	7	2	4	3	30	59.5	6.8	0	0	2	11	9	3	2	3
18301....	41	64.7	7.8	+1.0	0	2	5	9	8	8	9	41	63.8	7.6	+ .8	0	6	3	9	6	4	13	41	64.0	7.6	+ .8	0	3	7	5	11	5	10
18362....	40	63.8	7.6	+ .8	3	1	5	10	3	5	13	40	65.1	7.8	+1.0	3	2	8	2	5	4	16	40	64.1	7.6	+ .8	2	5	1	9	5	4	14
18601....	41	54.8	5.9	— .9	4	9	12	8	4	3	1	39	59.4	6.6	— .2	3	6	6	7	3	9	5	39	57.1	6.2	— .6	3	6	8	9	5	6	2
18702....	20	53.8	5.8	−1.0	4	4	2	6	3	0	1	20	53.7	5.8	−1.0	2	6	4	1	4	2	1	20	54.0	5.8	−1.0	3	4	4	4	3	2	0
18703....	28	51.8	5.5	−1.3	2	11	7	6	2	0	0	28	46.9	4.9	−1.9	8	11	6	2	0	1	0	28	49.6	5.2	−1.6	4	12	9	2	1	0	0
18704....	18	53.9	5.8	−1.0	1	7	3	3	3	0	1	18	52.2	5.5	−1.3	3	5	5	1	1	3	0	18	52.8	5.6	−1.2	2	7	4	0	3	1	1
18705....	58	52.3	5.5	−1.3	8	18	17	7	4	1	3	55	54.7	5.9	— .9	8	10	13	10	5	4	5	55	53.3	5.6	−1.2	6	15	14	10	3	4	3
18706....	21	57.4	6.2	— .6	1	3	8	3	3	1	2	21	53.2	5.6	−1.2	5	4	4	4	1	2	1	21	55.6	6.1	— .7	0	6	6	3	4	1	1
18707....	20	50.9	5.4	−1.4	3	4	8	4	1	0	0	20	54.7	5.9	— .9	2	6	2	4	3	2	1	20	53.0	5.6	−1.2	2	7	3	3	5	0	0
18708....	30	48.2	5.0	−1.8	8	9	8	3	2	0	0	31	47.9	5.0	−1.8	8	10	7	3	1	2	0	30	48.6	5.1	−1.7	7	10	7	4	1	1	0
18709....	45	50.6	5.4	−1.4	9	12	15	5	3	0	1	45	49.6	5.2	−1.6	9	17	8	5	3	1	2	45	50.3	5.2	−1.6	10	13	12	5	3	1	1
18710....	20	59.2	6.6	— .2	0	4	6	3	3	3	1	20	60.6	7.0	+ .2	0	5	3	3	1	4	4	20	60.1	6.8	0	0	4	5	3	1	4	3
18711....	31	61.6	7.2	+ .4	0	2	8	8	7	1	5	31	59.8	6.8	0	0	3	11	9	1	3	4	31	61.1	7.0	+ .2	0	3	10	6	5	2	5
18713....	21	54.6	5.9	— .9	4	4	4	2	3	1	3	21	55.4	5.9	— .9	4	4	3	3	3	3	1	21	55.2	5.9	— .9	3	5	2	5	1	3	2

18714....	21	57.1	6.2	— .6	1	2	8	3	4	3	0	21	54.4	5.8	—1.0	3	3	4	6	2	1	2	21	56.0	6.1	— .7	2	3	5	4	6	1	0
18801....	46	65.3	7.8	+1.0	1	1	9	8	2	10	15	46	61.7	7.2	+ .4	3	6	6	8	4	8	11	46	63.3	7.4	+ .6	0	5	10	4	9	4	14
19001....	42	57.1	6.2	— .6	1	4	18	11	2	5	1	42	55.5	6.1	— .7	4	11	7	9	4	5	2	42	56.3	6.1	— .7	1	10	12	7	8	2	2
19002....	40	80.4	11.0	+4.2	0	0	0	0	0	2	38	40	77.2	10.9	+4.1	0	0	0	3	2	0	35	40	78.5	11.0	+4.2	0	0	0	0	1	0	39
19003....	35	69.1	8.8	+2.0	0	1	1	9	2	5	17	35	66.5	8.3	+1.5	0	4	3	4	2	6	16	35	68.0	8.5	+1.7	0	1	3	5	5	8	13
19004....	23	61.4	7.0	+ .2	0	2	4	7	6	1	3	23	62.7	7.4	+ .6	0	0	8	6	2	4	3	23	62.0	7.2	+ .4	0	1	7	6	4	2	3
19005....	23	65.5	8.1	+1.3	0	2	1	6	3	5	6	23	64.2	7.6	+ .8	0	3	5	2	2	5	6	23	65.1	7.8	+1.0	0	2	3	4	5	3	6
19301....	40	69.2	8.8	+2.0	0	2	1	6	4	5	22	40	71.3	9.3	+2.5	2	0	2	2	2	1	31	40	70.0	9.0	+2.2	1	1	1	2	5	3	27
19701....	14	62.1	7.2	+ .4	0	0	5	4	1	3	1	14	65.4	7.8	+1.0	0	1	1	3	2	4	3	14	64.1	7.6	+ .8	0	0	3	3	4	1	3
19702....	30	65.6	8.1	+1.3	0	0	5	5	6	7	7	30	65.6	8.1	+1.3	0	1	5	2	4	10	8	30	65.8	8.1	+1.3	0	0	4	4	8	6	8
19703....	19	64.5	7.8	+1.0	0	0	2	6	4	2	5	19	66.8	8.3	+1.5	0	0	3	2	3	6	5	19	65.9	8.1	+1.3	0	0	2	4	6	4	3
19704....	30	68.8	8.8	+2.0	0	0	1	3	8	5	13	30	65.3	7.8	+1.0	0	0	4	3	10	7	6	30	66.6	8.3	+1.5	0	0	2	7	7	5	9
19705....	15	64.2	7.6	+ .8	0	0	3	3	3	3	3	15	59.4	6.6	— .2	0	4	2	3	1	4	1	15	61.7	7.2	+ .4	0	0	5	3	2	4	1
19706....	8	60.4	6.8	0	0	0	4	2	0	2	0	8	62.1	7.2	+ .4	0	1	0	3	2	2	0	8	61.4	7.0	+ .2	0	0	1	4	2	1	0
19801....	38	62.5	7.4	+ .6	0	0	6	13	14	3	2	38	60.3	6.8	0	1	3	8	13	7	3	3	38	61.2	7.0	+ .2	0	1	9	13	12	0	3
20001....	21	62.1	7.2	+ .4	0	3	3	5	4	4	2	21	60.1	6.8	0	1	3	6	3	1	3	4	21	61.4	7.0	+ .2	0	3	5	4	2	3	4
20002....	15	64.0	7.6	+ .8	0	0	2	4	2	7	0	15	50.7	5.4	—1.4	2	3	9	1	0	0	0	15	57.1	6.2	— .6	0	3	4	5	3	0	0
20003....	20	59.4	6.6	— .2	0	1	7	8	3	0	1	20	65.1	7.8	+1.0	0	3	2	1	4	1	9	20	62.2	7.2	+ .4	0	1	3	5	6	4	1
20301....	36	61.3	7.0	+ .2	0	0	9	12	10	4	1	36	66.5	8.3	+1.5	0	3	2	6	5	10	10	36	63.9	7.6	+ .8	0	0	3	10	11	9	3
20701....	34	61.1	7.0	+ .2	3	2	7	5	3	10	4	34	59.0	6.6	— .2	2	6	4	7	3	8	4	34	60.4	6.8	0	3	2	5	7	8	6	3
20901....	20	54.9	5.9	— .9	3	4	3	3	4	2	1	20	57.9	6.4	— .4	2	5	3	3	0	3	4	20	56.8	6.2	— .6	1	6	3	2	3	3	2
20902....	22	52.3	5.5	—1.3	1	7	8	3	3	0	0	22	49.0	5.1	—1.7	6	7	4	0	3	2	0	22	50.9	5.4	—1.4	4	8	4	3	2	1	0
20903....	11	54.3	5.8	—1.0	0	2	6	2	1	0	0	11	55.4	5.9	— .9	0	2	6	2	1	0	0	11	55.0	5.9	— .9	0	2	7	2	0	0	0
21201....	29	55.2	5.9	— .9	1	7	11	5	3	2	0	29	50.6	5.4	—1.4	4	10	11	2	0	1	1	29	53.1	5.6	—1.2	1	9	12	4	1	1	1
21202....	8	49.8	5.2	—1.6	1	3	4	0	0	0	0	8	42.9	4.5	—2.3	3	4	0	1	0	0	0	8	47.1	4.9	—1.9	2	2	3	1	0	0	0
21203....	30	53.9	5.8	—1.0	2	7	13	4	1	3	0	30	54.9	5.9	— .9	1	11	8	5	2	1	2	30	54.6	5.9	— .9	2	6	13	4	2	2	1
21204....	41	55.7	6.1	— .7	0	11	10	17	2	1	0	41	49.7	5.2	—1.6	7	14	13	3	3	1	0	41	52.9	5.6	—1.2	1	14	13	11	2	0	0
21401....	28	66.8	8.3	+1.5	0	0	2	8	4	5	9	28	66.1	8.1	+1.3	0	0	3	6	4	7	8	28	66.7	8.3	+1.5	0	0	1	7	6	7	7
21402....	26	65.6	8.1	+1.3	0	0	5	4	2	7	8	26	66.0	8.1	+1.3	0	0	4	5	3	5	9	26	66.0	8.1	+1.3	0	0	5	4	3	6	8
21403....	31	61.5	7.2	+ .4	0	2	4	13	7	3	2	31	60.8	7.0	+ .2	0	5	6	8	3	5	4	31	61.5	7.2	+ .4	0	2	6	9	9	3	2
21404....	35	56.5	6.2	— .6	2	6	8	12	4	3	0	35	59.3	6.6	— .2	2	7	5	7	6	4	4	35	57.8	6.4	— .4	2	6	7	8	8	3	1
21405....	43	64.3	7.6	+ .8	0	1	6	12	8	5	11	43	61.5	7.2	+ .4	3	3	5	12	3	12	5	43	62.6	7.4	+ .6	1	2	6	12	6	10	6
21406....	24	59.7	6.8	0	0	4	6	4	3	5	2	24	57.3	6.2	— .6	3	2	7	4	2	5	1	24	58.8	6.6	— .2	0	5	6	4	3	5	1
21407....	42	58.9	6.6	— .2	0	5	9	18	5	5	0	42	60.4	6.8	0	2	4	9	10	4	9	4	42	59.5	6.8	0	1	2	10	12	12	3	2
21408....	35	57.4	6.2	— .6	2	3	9	14	5	2	0	35	46.9	4.9	—1.9	3	23	9	0	0	0	0	35	52.1	5.5	—1.3	2	10	18	5	0	0	0

TABLE II—CONTINUED

School	Arithmetic computation											Arithmetic reasoning											Arithmetic average										
					Distribution											Distribution											Distribution						
	N	M	GE	D	−3	−2	−1	A	+1	+2	+3	N	M	GE	D	−3	−2	−1	A	+1	+2	+3	N	M	GE	D	−3	−2	−1	A	+1	+2	+3
21409....	5	55.8	6.1	— .7	0	1	2	2	0	0	0	5	57.8	6.4	— .4	0	1	2	1	0	1	0	5	57.0	6.2	— .6	0	0	3	1	1	0	0
21410....	43	58.5	6.6	— .2	0	5	14	14	7	3	0	43	63.1	7.4	+ .6	0	1	11	8	8	8	7	43	61.0	7.0	+ .2	0	1	12	13	10	5	2
21411....	29	66.7	8.3	+1.5	1	0	4	3	6	4	11	29	65.7	8.1	+1.3	0	3	2	4	7	2	11	29	67.1	8.3	+1.5	1	1	4	1	9	4	9
21412....	44	67.0	8.3	+1.5	0	1	5	8	6	10	14	44	65.7	8.1	+1.3	0	0	7	6	9	9	13	44	66.1	8.1	+1.3	0	0	6	7	9	7	15
21413....	36	56.2	6.1	— .7	1	7	14	10	2	2	0	36	58.0	6.4	— .4	0	9	8	8	3	6	2	36	56.9	6.2	— .6	0	7	12	8	7	2	0
21414....	74	63.2	7.4	+ .6	2	1	7	24	14	15	11	74	62.2	7.2	+ .4	3	4	8	23	13	11	12	74	62.5	7.4	+ .6	2	3	7	26	12	14	10
21415....	66	49.5	5.2	—1.6	18	13	23	9	3	0	0	66	52.3	5.5	—1.3	10	21	13	10	7	4	1	66	51.0	5.4	—1.4	16	14	19	10	6	1	0
21416....	23	55.9	6.1	— .7	0	8	6	5	2	1	1	23	54.7	5.9	— .9	1	6	7	5	2	0	2	23	55.2	5.9	— .9	1	5	8	7	0	1	1
21417....	41	59.5	6.8	0	0	5	10	13	7	2	4	41	56.6	6.2	— .6	2	9	13	9	2	4	2	41	58.0	6.4	— .4	2	5	9	15	6	1	3
21418....	20	64.4	7.6	+ .8	0	1	2	5	3	6	3	20	62.4	7.2	+ .4	0	3	2	5	3	3	4	20	63.2	7.4	+ .6	0	1	4	3	6	3	3
21604....	118	56.2	6.1	— .7	12	17	30	25	18	15	1	118	55.3	5.9	— .9	18	25	21	19	8	13	14	118	56.0	6.1	— .7	13	19	26	21	16	15	8
22401....	14	58.2	6.4	— .4	0	1	6	4	3	0	0	14	51.3	5.4	—1.4	6	0	0	4	2	2	0	14	54.9	5.9	— .9	0	6	0	6	1	1	0
22601....	16	63.7	7.6	+ .8	0	0	3	4	3	3	3	16	62.2	7.2	+ .4	1	0	5	2	2	2	4	16	63.4	7.4	+ .6	0	1	3	4	1	4	3
22602....	18	60.2	6.8	0	0	1	8	3	3	0	3	18	61.4	7.0	+ .2	1	1	2	5	3	3	3	18	60.5	7.0	+ .2	0	1	5	6	2	2	2
22603....	14	62.6	7.4	+ .6	0	1	2	5	1	4	1	14	63.9	7.6	+ .8	0	1	2	1	3	5	2	14	63.1	7.4	+ .6	0	1	2	1	7	1	2
22604....	18	65.4	7.8	+1.0	0	2	1	2	5	1	7	18	65.4	7.8	+1.0	1	0	1	2	4	5	5	18	65.7	8.1	+1.3	1	0	1	2	5	4	5
22605....	24	64.5	7.8	+1.0	0	1	0	8	8	2	5	24	68.4	8.5	+1.7	0	0	5	2	2	6	9	24	66.2	8.1	+1.3	0	0	3	5	5	6	5
22801....	28	58.1	6.4	— .4	1	3	8	9	5	2	0	28	58.7	6.6	— .2	2	4	5	7	1	4	5	28	58.6	6.6	— .2	1	5	5	7	5	4	1
22803....	23	61.6	7.2	+ .4	0	0	9	4	5	2	3	23	58.9	6.6	— .2	0	4	6	3	3	6	1	23	60.6	7.0	+ .2	0	2	8	5	2	4	2
22804....	31	62.5	7.4	+ .6	1	1	1	12	8	4	4	31	56.4	6.1	— .7	2	6	8	9	1	1	4	31	59.8	6.8	0	1	1	7	13	3	2	4
23201....	60	64.1	7.6	+ .8	0	1	5	17	17	11	9	60	62.4	7.2	+ .4	1	3	15	10	9	11	11	60	62.8	7.4	+ .6	0	1	12	20	10	9	8
23202....	20	65.7	8.1	+1.3	1	0	2	4	3	3	7	20	64.8	7.8	+1.0	1	1	2	2	4	3	7	20	65.0	7.8	+1.0	1	1	2	1	5	4	6
23502....	60	61.2	7.0	+ .2	2	6	14	9	8	13	8	60	62.9	7.4	+ .6	3	7	8	12	1	10	19	60	62.0	7.2	+ .4	3	4	12	10	5	13	13
23601....	28	65.7	8.1	+1.3	0	0	4	6	3	7	8	28	71.1	9.3	+2.5	0	0	1	4	1	7	15	28	68.7	8.8	+2.0	0	0	1	6	2	8	11
23602....	35	61.3	7.0	+ .2	1	5	5	8	5	5	6	34	58.9	6.6	— .2	0	9	6	7	3	6	3	34	60.3	6.8	0	1	3	9	7	4	6	4
6A PUPILS TOWNSHIP																																	
00601....	7	59.7	6.8	0	0	1	1	3	0	2	0	7	49.1	5.1	—1.7	2	2	1	0	2	0	0	7	54.4	5.8	—1.0	1	1	2	1	1	1	0
00602....	5	72.6	9.8	+3.0	0	0	0	1	0	2	2	5	76.2	10.6	+3.8	0	0	0	0	0	1	4	5	74.8	10.3	+3.5	0	0	0	0	1	0	4
00603....	16	64.4	7.6	+ .8	0	1	3	2	1	6	3	16	58.9	6.6	— .2	1	3	2	4	2	2	2	16	61.9	7.2	+ .4	0	1	4	2	4	3	2
00604....	4	70.5	9.3	+2.5	0	0	0	1	0	0	3	4	72.9	9.5	+2.7	0	0	0	0	0	2	2	4	71.5	9.5	+2.7	0	0	0	0	1	0	3
00605....	5	71.4	9.3	+2.5	0	0	0	2	0	0	3	5	71.8	9.5	+2.7	0	0	0	0	1	1	3	5	71.8	9.5	+2.7	0	0	0	0	1	2	2

00606....	5	64.4	7.6	+ .8	0	1	1	0	0	1	2	5	64.6	7.8	+1.0	0	1	1	0	0	1	2	5	64.6	7.8	+1.0	0	1	1	0	0	1	2
00607....	32	65.4	7.8	+1.0	1	2	3	4	5	8	9	32	62.5	7.4	+ .6	1	3	4	6	4	9	5	32	64.3	7.6	+ .8	1	1	5	5	3	11	6
00608....	17	65.1	7.8	+1.0	0	1	4	4	1	1	6	17	62.0	7.2	+ .4	1	1	4	2	1	5	3	17	63.8	7.6	+ .8	0	1	5	3	1	2	5
00609....	10	68.0	8.5	+1.7	0	0	1	0	2	5	2	10	71.8	9.5	+2.7	0	0	1	0	1	2	6	10	70.1	9.0	+2.2	0	0	0	2	0	2	6
00610....	16	61.8	7.2	+ .4	1	1	3	4	1	3	3	16	53.5	5.8	−1.0	2	3	4	5	1	1	0	16	57.9	6.4	− .4	1	2	2	7	1	2	1
00611....	21	62.4	7.2	+ .4	0	1	4	7	2	4	3	21	58.7	6.6	− .2	2	4	3	1	4	1	6	21	60.8	7.0	+ .2	1	2	5	3	3	3	4
00612....	11	68.3	8.5	+1.7	0	0	0	1	2	5	3	11	67.5	8.5	+1.7	1	0	0	1	0	3	6	11	68.2	8.5	+1.7	0	1	0	0	1	6	3
00613....	9	69.0	8.8	+2.0	0	0	0	1	4	2	2	9	75.6	10.6	+3.8	0	0	0	0	0	1	8	9	72.4	9.5	+2.7	0	0	0	1	0	5	3
00614....	8	64.5	7.8	+1.0	0	0	0	2	3	2	1	8	64.3	7.6	+ .8	0	0	0	3	3	1	1	8	64.6	7.8	+1.0	0	0	0	1	5	2	0
00615....	29	60.4	6.8	0	0	1	11	8	4	1	4	29	55.8	6.1	− .7	4	4	9	3	2	5	2	29	58.4	6.4	− .4	0	7	7	7	3	2	3
00616....	11	62.4	7.2	+ .4	0	0	2	5	1	2	1	11	60.5	7.0	+ .2	0	2	2	3	1	1	2	11	61.7	7.2	+ .4	0	0	4	3	1	1	2
00617....	15	61.7	7.2	+ .4	0	0	2	9	1	3	0	15	65.1	7.8	+1.0	0	0	1	4	5	3	2	15	64.0	7.6	+ .8	0	0	0	7	5	2	1
00618....	10	61.5	7.2	+ .4	1	1	0	2	0	2	4	10	57.0	6.2	− .6	1	2	1	1	1	2	2	10	59.4	6.6	− .2	1	1	1	1	2	1	3
01201....	16	56.1	6.1	− .7	2	4	3	3	1	2	1	16	55.2	5.9	− .9	2	5	1	3	1	1	3	16	55.5	6.1	− .7	3	3	3	3	1	0	3
01202....	14	64.6	7.8	+1.0	0	0	4	2	1	5	2	14	66.4	8.1	+1.3	0	1	3	0	3	3	4	14	65.9	8.1	+1.3	0	0	0	2	4	1	3
01203....	16	68.1	8.5	+1.7	0	0	1	3	2	3	7	16	64.1	7.6	+ .8	1	1	1	1	4	4	4	16	65.8	8.1	+1.3	1	1	0	2	3	4	5
01204....	13	64.9	7.8	+1.0	0	1	1	4	2	2	3	13	59.3	6.6	− .2	1	2	2	1	2	2	3	13	62.1	7.2	+ .4	1	1	2	3	2	1	3
01205....	25	60.3	6.8	0	0	2	8	7	2	3	3	25	58.8	6.6	− .2	2	5	5	2	3	3	5	25	59.2	6.6	− .2	1	2	9	3	4	2	4
01206....	18	62.9	7.4	+ .6	1	1	2	2	5	3	4	18	61.8	7.2	+ .4	1	1	5	1	1	4	5	18	62.1	7.2	+ .4	1	1	4	3	2	3	4
01207....	8	70.5	9.3	+2.5	0	0	0	1	1	3	3	8	69.0	8.8	+2.0	0	0	1	2	1	1	3	8	69.5	9.0	+2.2	0	0	0	0	2	2	1
01208....	18	62.7	7.4	+ .6	0	0	3	7	4	3	1	18	65.2	7.8	+1.0	0	2	1	4	1	6	4	18	63.8	7.6	+ .8	0	0	3	4	7	1	3
01209....	19	64.0	7.6	+ .8	0	0	4	3	6	3	3	19	62.8	7.4	+ .6	0	2	4	3	2	3	5	19	63.2	7.4	+ .6	0	1	4	2	4	5	3
01212....	12	63.8	7.6	+ .8	0	0	2	3	2	4	1	12	62.8	7.4	+ .6	0	1	2	0	3	5	1	12	63.1	7.4	+ .6	0	0	3	2	3	3	1
01213....	12	31.3	3.4	−3.4	9	2	1	0	0	0	0	12	19.7	2.6	−4.2	12	0	0	0	0	0	0	12	25.3	2.9	−3.9	11	1	0	0	0	0	0
01214....	5	60.4	6.8	0	0	1	0	2	0	1	1	5	57.8	6.4	− .4	1	0	1	0	1	2	0	5	59.2	6.6	− .2	1	0	1	0	2	0	1
01215....	15	58.6	6.6	− .2	1	1	3	6	2	2	0	15	61.1	7.0	+ .2	0	3	0	5	0	5	2	15	59.6	6.8	0	0	3	1	4	4	3	0
01401....	12	59.3	6.6	− .2	0	1	4	5	0	1	1	12	56.8	6.2	− .6	1	3	2	2	2	0	2	12	57.3	6.2	− .6	1	2	2	4	1	0	2
01403....	24	65.8	8.1	+1.3	0	0	2	4	6	7	5	24	70.0	9.0	+2.2	0	1	0	2	3	4	14	24	68.1	8.5	+1.7	0	1	0	4	3	10	6
01407....	34	48.7	5.1	−1.7	8	10	9	6	1	0	0	34	45.4	4.7	−2.1	17	3	2	7	2	1	2	34	47.0	4.9	−1.9	14	7	3	7	1	2	5
01424....	37	59.3	6.6	− .2	0	4	15	5	4	5	4	37	59.3	6.6	− .2	1	9	10	2	5	4	6	37	59.1	6.6	− .2	0	6	14	3	6	3	5
01425....	22	67.4	8.3	+1.5	0	0	3	2	6	4	7	22	65.4	7.8	+1.0	0	2	2	5	2	2	9	22	66.2	8.1	+1.3	0	0	2	4	6	1	9
01426....	11	66.4	8.1	+1.3	0	0	2	2	1	3	3	11	62.6	7.4	+ .6	0	3	2	0	0	2	4	11	64.4	7.6	+ .8	0	1	4	0	0	2	4
01501....	24	64.3	7.6	+ .8	0	2	4	6	3	3	6	24	65.2	7.8	+1.0	0	2	3	6	3	3	7	24	64.5	7.8	+1.0	0	1	5	6	3	2	7
01502....	5	66.4	8.1	+1.3	0	0	1	1	0	1	2	5	70.6	9.3	+2.5	0	0	1	0	1	0	3	5	68.6	8.8	+2.0	0	0	1	1	0	0	3
01504....	1	65.0	7.8	+1.0	0	0	0	0	1	0	0	1	68.0	8.5	+1.7	0	0	0	0	0	1	0	1	67.0	8.3	+1.5	0	0	0	0	1	0	0

TABLE II—CONTINUED

School	Arithmetic computation										Arithmetic reasoning										Arithmetic average									
					Distribution										Distribution										Distribution						
	N	M	GE	D	−3	−2	−1	A	+1	+2	+3	N	M	GE	D	−3	−2	−1	A	+1	+2	+3	N	M	GE	D	−3	−2	−1	A	+1	+2	+3
01505....	8	59.8	6.8	0	0	0	3	3	1	0	1	8	61.5	7.2	+ .4	0	0	3	1	1	2	1	8	60.9	7.6	+ .2	0	0	3	2	2	0	1
01506....	6	63.8	7.6	+ .8	0	0	2	1	2	0	1	6	68.8	8.8	+2.0	0	0	1	1	0	2	2	6	66.5	8.3	+1.5	0	0	2	0	1	1	2
01511....	18	60.8	7.0	+ .2	1	1	5	0	4	4	3	18	61.8	7.2	+ .4	**1**	**3**	**1**	**3**	**4**	**1**	**5**	18	61.0	7.0	+ .2	1	3	0	4	5	2	3
01512....	14	51.5	5.5	−1.3	0	0	4	6	1	2	1	14	56.5	6.2	− .6	0	2	6	4	0	2	0	14	59.4	6.6	− .2	0	0	7	3	2	1	1
01514....	1	67.0	8.3	+1.5	0	0	0	0	0	1	0	1	59.0	6.6	− .2	0	0	0	1	0	0	0	1	63.0	7.4	+ .6	0	0	0	0	1	0	0
01515....	5	58.6	6.6	− .2	0	0	3	1	1	0	0	5	62.8	7.4	+ .6	0	0	0	3	0	2	0	5	60.4	6.8	0	0	0	0	4	1	0	0
01516....	2	58.0	6.4	− .4	0	1	0	0	0	1	0	2	64.0	7.6	+ .8	0	0	1	0	0	0	1	2	61.0	7.0	+ .2	0	0	0	1	1	0	0
01517....	4	67.3	8.3	+1.5	0	0	0	0	1	3	0	4	65.0	7.8	+1.0	0	1	0	0	1	0	2	4	66.5	8.3	+1.5	0	0	0	0	1	2	0
01523....	2	78.0	11.0	+4.2	0	0	0	0	0	0	2	2	72.5	9.8	+3.0	0	0	0	0	0	0	2	2	75.5	10.6	+3.8	0	0	0	0	0	0	2
02010....	41	59.7	6.8	0	1	4	10	13	4	6	3	41	64.7	7.8	+1.0	2	1	7	6	4	10	11	41	62.1	7.2	+ .4	0	3	7	10	12	5	4
02011....	17	60.0	6.8	0	1	1	4	5	2	2	2	17	59.5	6.8	0	0	4	4	3	3	1	2	17	59.5	6.8	0	0	3	3	7	1	1	2
02311....	47	52.5	5.6	−1.2	3	13	13	17	1	0	0	47	50.0	5.2	−1.6	11	13	11	7	4	0	1	47	51.0	5.4	−1.4	4	18	12	12	0	1	0
02501....	12	56.3	6.1	− .7	2	1	3	2	3	1	0	12	54.5	5.9	− .9	1	4	4	0	2	0	1	12	55.7	6.1	− .7	1	2	4	2	2	0	1
02502....	7	60.3	6.8	0	0	1	2	2	1	0	1	7	60.4	6.8	0	0	0	5	0	0	1	1	7	60.6	7.0	+ .2	0	0	2	4	0	0	1
02503....	30	53.7	5.8	−1.0	1	8	13	5	2	1	0	30	54.3	5.8	−1.0	3	8	9	4	1	5	0	30	54.1	5.8	−1.0	4	5	11	7	1	2	0
02504....	30	72.2	9.5	+2.7	0	0	2	0	3	5	20	30	68.5	8.8	+2.0	0	1	2	1	6	7	13	30	70.8	9.3	+2.5	0	0	2	2	2	7	17
02505....	7	60.4	6.8	0	0	0	2	3	1	1	0	7	60.4	6.8	0	0	1	1	3	0	1	1	7	60.6	7.0	+ .2	0	1	0	4	1	1	0
02506....	16	62.4	7.2	+ .4	0	1	6	1	2	3	3	16	61.4	7.0	+ .2	0	4	1	2	3	4	2	16	62.2	7.2	+ .4	0	3	2	2	3	3	3
02507....	15	63.5	7.6	+ .8	0	0	4	3	2	2	4	15	63.3	7.4	+ .6	1	2	1	1	1	5	4	15	63.7	7.6	+ .8	1	1	2	1	4	2	4
02508....	15	59.8	6.8	0	2	0	3	0	6	1	3	15	63.3	7.4	+ .6	1	1	1	3	3	2	4	15	61.7	7.2	+ .4	2	0	1	3	4	1	4
02509....	8	59.5	6.8	0	1	0	1	3	2	0	1	8	60.9	7.0	+ .2	0	3	0	0	1	2	2	8	60.4	6.8	0	0	2	1	1	1	2	1
02510....	21	56.0	6.1	− .7	0	7	5	3	2	3	1	21	59.1	6.6	− .2	2	6	2	3	1	0	7	21	57.8	6.4	− .4	1	6	4	2	2	3	3
02511....	25	62.1	7.2	+ .4	1	2	4	7	4	1	6	25	66.0	8.1	+1.3	0	2	2	3	5	6	7	25	64.2	7.6	+ .8	1	1	2	8	4	2	7
02902....	12	56.5	6.2	− .6	0	1	2	3	0	1	5	12	70.5	9.3	+2.5	0	1	0	3	0	0	8	12	68.2	8.5	+1.7	0	0	2	3	1	0	6
03001....	11	59.2	6.6	− .2	1	1	4	1	1	2	1	11	57.1	6.2	− .6	2	1	2	3	0	1	2	11	58.0	6.4	− .4	0	3	2	2	1	2	1
03002....	8	65.8	8.1	+1.3	0	0	2	2	0	2	2	8	61.8	7.2	+ .4	0	2	1	0	0	1	4	8	63.5	7.6	+ .8	0	0	3	0	1	2	2
03003....	13	63.1	7.4	+ .6	0	0	2	4	3	4	0	13	63.7	7.6	+ .8	0	1	3	2	0	4	3	13	63.4	7.4	+ .6	0	0	2	3	3	4	1
03004....	10	60.9	7.0	+ .2	1	0	1	5	1	1	1	10	61.0	7.0	+ .2	1	0	2	3	0	2	2	10	61.1	7.0	+ .2	1	0	0	5	2	0	2
03005....	19	62.1	7.2	+ .4	0	1	6	2	4	3	3	19	64.1	7.6	+ .8	0	3	2	3	3	3	5	19	63.3	7.4	+ .6	0	3	2	3	6	1	4
03006....	15	59.8	6.8	0	0	3	2	4	3	2	1	15	57.3	6.2	− .6	2	3	0	2	3	3	2	15	58.2	6.4	− .4	1	3	2	2	5	1	1

03007....	10	69.8	9.0	+2.2	0	0	0	2	3	0	5	10	53.2	5.6	—1.2	0	3	5	2	0	0	0	10	61.3	7.0	+ .2	0	0	3	2	3	2	0
03008....	23	55.9	6.1	— .7	1	6	6	6	2	1	1	23	57.0	6.2	— .6	0	7	7	4	1	1	3	23	56.5	6.2	— .6	0	7	6	5	2	2	1
03009....	31	64.6	7.8	+1.0	1	2	4	5	3	7	9	31	63.0	7.4	+ .6	2	8	5	2	6	1	6	30	57.5	6.4	— .4	2	8	5	3	6	5	1
03010....	30	56.7	6.2	— .6	1	8	7	5	5	2	2	30	57.6	6.4	— .4	2	8	5	2	6	1	6	30	57.5	6.4	— .4	2	8	5	3	6	5	1
03011....	11	64.9	7.8	+1.0	0	0	0	6	1	0	4	11	59.5	6.8	0	0	2	3	3	0	3	0	11	61.9	7.2	+ .4	0	0	3	2	4	1	1
03203....	15	60.7	7.0	+ .2	2	1	1	5	2	2	2	15	62.7	7.4	+ .6	1	1	2	3	2	2	4	15	61.5	7.2	+ .4	1	2	0	3	4	2	3
03204....	9	64.2	7.6	+ .8	0	0	2	3	1	1	2	9	64.2	7.6	+ .8	0	2	0	2	2	1	2	9	63.3	7.4	+ .6	0	2	0	3	1	1	2
03207....	45	59.4	6.6	— .2	0	7	10	13	6	4	5	45	57.6	6.4	— .4	2	12	8	6	5	6	6	45	58.8	6.6	— .2	1	8	14	7	4	7	4
03801....	20	55.9	6.1	— .7	1	4	6	4	2	3	0	20	52.9	5.6	—1.2	2	9	4	2	0	3	0	20	54.6	5.9	— .9	1	6	6	2	4	1	0
03802....	6	64.3	7.6	+ .8	0	0	1	1	1	1	2	6	61.5	7.2	+ .4	1	0	1	1	0	2	1	6	62.7	7.4	+ .6	0	1	0	2	0	2	1
03804....	10	64.3	7.6	+ .8	0	1	2	1	1	2	3	10	63.7	7.6	+ .8	0	2	2	0	0	0	6	10	63.8	7.6	+ .8	0	2	2	0	0	1	5
03806....	13	59.0	6.6	— .2	1	1	2	5	1	3	0	13	47.8	5.0	—1.8	2	6	4	1	0	0	0	13	53.3	5.6	—1.2	0	5	4	3	1	0	0
03807....	12	56.5	6.2	— .6	1	2	1	6	2	0	0	12	53.0	5.6	—1.2	1	4	4	1	1	1	0	12	55.0	5.9	— .9	0	4	3	2	3	0	0
03808....	6	63.3	7.4	+ .6	0	0	1	3	0	0	2	6	63.7	7.6	+ .8	0	2	0	0	0	3	1	6	63.2	7.4	+ .6	0	1	1	0	2	1	1
03809....	3	66.7	8.3	+1.5	0	0	1	0	0	0	2	3	73.7	10.0	+3.2	0	0	0	0	0	1	2	3	70.0	9.0	+2.2	0	0	0	1	0	0	2
03810....	12	60.8	7.0	+ .2	1	1	1	2	3	4	0	12	57.6	6.4	— .4	1	3	2	1	2	1	2	12	59.3	6.6	— .2	1	1	3	1	3	1	2
03811....	25	63.1	7.4	+ .6	0	0	6	5	6	4	4	25	64.5	7.8	+1.0	1	0	4	3	6	5	6	25	64.0	7.6	+ .8	0	1	3	7	4	5	5
03812....	2	50.5	5.4	—1.4	0	1	1	0	0	0	0	2	52.5	5.6	—1.2	0	0	2	0	0	0	0	2	51.5	5.5	—1.3	0	1	1	0	0	0	0
03814....	1	62.0	7.2	+ .4	0	0	0	1	0	0	0	1	62.0	7.2	+ .4	0	0	0	1	0	0	0	1	62.0	7.2	+ .4	0	0	0	1	0	0	0
03815....	2	41.0	4.3	—2.5	1	0	1	0	0	0	0	2	41.0	4.3	—2.5	1	0	1	0	0	0	0	2	41.0	4.3	—2.5	1	0	1	0	0	0	0
03816....	4	55.0	5.9	— .9	0	2	0	2	0	0	0	4	56.8	6.2	— .6	0	1	1	0	2	0	0	4	55.5	6.1	— .7	0	0	2	2	0	0	0
03817....	3	71.0	9.3	+2.5	0	0	0	1	0	0	2	3	71.7	9.5	+2.7	0	0	0	0	1	0	2	3	71.3	9.3	+2.5	0	0	0	1	0	0	2
03818....	4	52.3	5.5	—1.3	0	2	1	1	0	0	0	4	55.5	6.1	— .7	0	1	2	0	0	0	1	4	53.5	5.8	—1.0	0	1	2	0	1	0	0
03819....	1	57.0	6.2	— .6	0	0	1	0	0	0	0	1	73.0	9.8	+3.0	0	0	0	0	0	0	1	1	65.0	7.8	+1.0	0	0	0	0	1	0	0
03821....	3	66.7	8.3	+1.5	0	0	0	1	0	1	1	3	66.0	8.1	+1.3	0	0	0	1	1	0	1	3	66.0	8.1	+1.3	0	0	0	1	1	0	1
03822....	3	60.0	6.8	0	0	0	2	0	0	0	1	3	56.7	6.2	— .6	0	1	1	0	0	1	0	3	58.7	6.6	— .2	0	0	2	0	0	0	1
04401....	12	55.3	5.9	— .9	1	1	4	4	1	1	0	12	52.3	5.5	—1.3	2	3	2	1	3	0	1	12	54.1	5.8	—1.0	1	3	2	4	1	1	0
04402....	9	54.8	5.9	— .9	0	3	1	4	1	0	0	9	56.7	6.2	— .6	0	3	1	3	1	1	0	9	55.9	6.1	— .7	0	2	3	3	1	0	0
04404....	8	65.4	7.8	+1.0	0	0	3	0	0	2	3	8	65.1	7.8	+1.0	0	1	0	3	0	2	2	8	65.6	8.1	+1.3	0	0	1	2	1	1	3
04405....	3	61.3	7.0	+ .2	0	0	0	2	1	0	0	3	66.3	8.1	+1.3	0	0	0	1	0	2	0	3	64.0	7.6	+ .8	0	0	0	1	1	1	0
04406....	23	56.1	6.1	— .7	1	4	6	5	6	1	0	23	51.4	5.4	—1.4	3	8	5	3	3	1	0	23	54.0	5.8	—1.0	3	4	6	4	6	0	0
04407....	6	64.0	7.6	+ .8	0	0	0	2	3	1	0	6	63.8	7.6	+ .8	0	0	1	1	3	0	1	6	64.2	7.6	+ .8	0	0	0	2	3	0	1
04408....	6	62.2	7.2	+ .4	0	0	1	2	1	2	0	6	57.0	6.2	— .6	0	2	2	0	1	1	0	6	59.8	6.8	0	0	0	2	2	1	1	0
04409....	6	65.3	7.8	+1.0	0	0	0	2	1	3	0	6	62.7	7.4	+ .6	0	1	1	1	0	2	1	6	64.2	7.6	+ .8	0	0	1	2	0	2	1
04410....	1	49.0	5.1	—1.7	0	1	0	0	0	0	0	1	55.0	5.9	— .9	0	0	1	0	0	0	0	1	52.0	5.5	—1.3	0	0	1	0	0	0	0

TABLE II—CONTINUED

School	Arithmetic computation										Arithmetic reasoning										Arithmetic average									
					Distribution										Distribution										Distribution					
	N	M	GE	D	−3	−2	−1	A	+1	+2	+3	N	M	GE	D	−3	−2	−1	A	+1	+2	+3	N	M	GE	D	−3	−2	−1	A	+1	+2	+3
04411....	28	64.1	7.6	+ .8	1	2	2	9	3	3	8	28	61.0	7.0	+ .2	3	3	4	3	4	4	7	28	62.8	7.4	+ .6	2	2	2	6	5	3	8
04412....	7	58.9	6.6	− .2	0	1	3	0	1	2	0	7	63.9	7.6	+ .8	0	1	2	0	1	1	2	7	61.6	7.2	+ .4	0	1	2	1	0	2	1
04413....	28	51.4	5.4	−1.4	3	11	6	6	0	1	1	28	48.3	5.0	−1.8	8	9	4	1	2	3	1	28	50.1	5.2	−1.6	6	12	2	2	5	0	1
04414....	15	62.4	7.2	+ .4	0	1	4	2	2	5	1	15	57.2	6.2	− .6	1	3	4	2	1	1	3	15	60.1	6.8	0	0	3	3	3	1	3	2
04416....	11	54.5	5.9	− .9	2	1	3	2	2	0	1	11	55.5	6.1	− .7	0	5	1	2	1	1	1	11	55.3	5.9	− .9	2	2	2	1	2	1	1
04417....	13	62.2	7.2	+ .4	1	0	4	2	2	0	4	13	55.4	5.9	− .9	2	3	1	1	1	3	2	13	59.1	6.6	− .2	1	2	3	1	2	0	4
04419....	3	64.7	7.8	+1.0	0	0	0	1	1	0	1	3	67.3	8.3	+1.5	0	0	0	0	0	3	0	3	66.3	8.1	+1.3	0	0	0	0	2	1	0
04420....	7	58.9	6.6	− .2	0	0	2	4	1	0	0	7	60.9	7.0	+ .2	0	0	2	4	0	0	1	7	60.0	6.8	0	0	0	1	5	0	1	0
04423....	18	54.3	5.8	−1.0	2	4	5	3	1	1	2	18	54.7	5.9	− .9	2	5	5	2	0	1	3	18	54.6	5.9	− .9	2	5	5	2	1	0	3
04424....	14	63.8	7.6	+ .8	0	1	1	4	3	2	3	14	67.1	8.3	+1.5	0	1	1	2	2	3	5	14	65.6	8.1	+1.3	0	1	0	3	4	2	4
04907....	23	65.7	8.1	+1.3	0	0	4	2	4	8	5	23	63.7	7.6	+ .8	0	3	4	2	2	3	9	23	64.9	7.8	+1.0	0	1	4	3	2	6	7
04920....	26	50.3	5.2	−1.6	3	8	14	1	0	0	0	26	55.5	6.1	− .7	1	5	9	7	3	1	0	26	52.6	5.6	−1.2	2	6	12	5	1	0	0
04921....	20	55.5	6.1	− .7	0	4	10	5	1	0	0	20	56.4	6.1	− .7	2	6	0	6	1	3	2	20	56.3	6.1	− .7	1	3	5	8	1	2	0
04922....	85	67.6	8.5	+1.7	0	4	4	27	6	14	30	85	63.6	7.6	+ .8	5	12	8	6	14	12	28	85	65.8	8.1	+1.3	2	7	8	8	18	18	24
04923....	33	56.9	6.2	− .6	1	8	8	6	5	2	3	33	59.3	6.6	− .2	1	7	8	4	2	6	5	33	57.9	6.4	− .4	1	10	6	3	6	3	4
04924....	23	63.0	7.4	+ .6	0	0	4	7	6	4	2	23	63.5	7.6	+ .8	1	1	1	4	7	4	5	23	63.3	7.4	+ .6	0	1	2	5	8	6	1
04931....	13	46.8	4.9	−1.9	4	4	3	2	0	0	0	13	45.7	4.8	−2.0	3	6	4	0	0	0	0	13	46.4	4.8	−2.0	3	6	4	0	0	0	0
04934....	21	62.0	7.2	+ .4	1	1	4	4	4	5	2	21	59.8	6.8	0	0	3	6	2	5	4	1	21	61.4	7.0	+ .2	0	2	5	3	5	4	2
06021....	59	59.6	6.8	0	0	3	22	17	8	7	2	59	58.6	6.6	− .2	6	9	7	14	5	8	10	59	59.2	6.6	− .2	1	7	13	16	11	9	2
06201....	2	70.0	9.0	+2.2	0	0	0	0	1	0	1	2	78.0	11.0	+4.2	0	0	0	0	0	0	2	2	74.0	10.0	+3.2	0	0	0	0	0	1	1
06203....	1	72.0	9.5	+2.7	0	0	0	0	0	0	1	1	36.0	3.8	−3.0	1	0	0	0	0	0	0	1	54.0	5.8	−1.0	0	0	1	0	0	0	0
06205....	3	52.7	5.6	−1.2	0	0	3	0	0	0	0	3	55.7	6.1	− .7	0	1	0	2	0	0	0	3	54.0	5.8	−1.0	0	0	3	0	0	0	0
06208....	16	60.7	7.0	+ .2	0	4	3	2	2	2	3	16	56.6	6.2	− .6	2	3	2	4	2	0	3	16	58.4	6.4	− .4	1	4	3	1	4	0	3
06211....	4	63.8	7.6	+ .8	0	0	1	1	0	1	1	4	60.0	6.8	0	0	2	0	0	0	1	1	4	61.5	7.2	+ .4	0	0	2	0	0	1	1
06216....	6	59.8	6.8	0	0	0	1	4	0	1	0	6	60.5	7.0	+ .2	0	0	2	2	1	1	0	6	59.7	6.8	0	0	0	2	2	2	0	0
06217....	2	61.5	7.2	+ .4	0	0	0	2	0	0	0	2	64.0	7.6	+ .8	0	0	0	0	2	0	0	2	62.5	7.4	+ .6	0	0	0	1	1	0	0
06220....	1	58.0	6.4	− .4	0	0	0	1	0	0	0	1	73.0	9.8	+3.0	0	0	0	0	0	0	1	1	65.0	7.8	+1.0	0	0	0	0	1	0	0
06221....	3	70.7	9.3	+2.5	0	0	0	0	0	2	1	3	70.7	9.3	+2.5	0	0	0	0	1	0	2	3	70.7	9.3	+2.5	0	0	0	0	1	1	1
06224....	8	59.6	6.8	0	0	0	3	2	3	0	0	8	63.9	7.6	+ .8	0	1	0	3	2	1	1	8	61.6	7.2	+ .4	0	0	2	2	3	0	1
06225....	2	60.0	6.8	0	0	0	0	2	0	0	0	2	66.5	8.3	+1.5	0	0	0	1	0	0	1	2	63.0	7.4	+ .6	0	0	0	1	1	0	0

06229....	45	58.9	6.6	— .2	1	7	13	11	4	5	4	45	51.1	5.4	—1.4	5	8	26	5	1	0	0	45	54.8	5.9	— .9	2	9	20	7	4	3	0
06230....	5	69.4	8.8	+2.0	0	0	0	0	1	2	2	5	68.4	8.5	+1.7	0	0	0	1	1	1	2	5	69.4	8.8	+2.0	0	0	0	0	3	1	1
06231....	3	57.7	6.4	— .4	0	1	0	1	0	1	0	3	62.3	7.2	+ .4	0	0	1	1	0	1	0	3	60.3	6.8	0	0	0	1	0	2	0	0
06232....	5	63.6	7.6	+ .8	0	0	0	3	1	0	1	5	62.0	7.2	+ .4	1	0	0	0	0	3	1	5	63.2	7.4	+ .6	0	1	0	0	2	1	1
06233....	3	54.7	5.9	— .9	0	1	1	0	1	0	0	3	49.0	5.1	—1.7	1	0	2	0	0	0	0	3	51.7	5.5	—1.3	0	1	1	1	0	0	0
06401....	23	72.5	9.8	+3.0	0	1	1	0	1	5	15	23	70.2	9.0	+2.2	1	1	0	2	2	5	12	23	71.0	9.3	+2.5	0	1	1	1	1	4	15
06402....	20	68.4	8.5	+1.7	0	0	0	4	4	6	6	20	67.7	8.5	+1.7	0	0	2	4	1	6	7	20	68.3	8.5	+1.7	0	0	0	5	3	6	6
06403....	12	63.3	7.4	+ .6	0	1	0	4	4	1	2	12	62.5	7.4	+ .6	0	1	2	3	1	3	2	12	63.1	7.4	+ .6	0	1	1	3	3	3	1
06404....	15	57.2	6.2	— .6	0	4	4	4	1	1	1	15	61.5	7.2	+ .4	1	1	3	4	1	2	3	15	59.3	6.6	— .2	0	3	2	5	2	1	2
06405....	12	69.7	9.0	+2.2	0	0	0	2	2	2	6	12	67.3	8.3	+1.5	0	0	0	5	1	2	4	12	68.7	8.8	+2.0	0	0	0	2	3	2	5
06407....	14	60.9	7.0	+ .2	0	0	3	6	3	1	1	14	63.9	7.6	+ .8	0	2	1	1	2	7	1	14	62.1	7.2	+ .4	0	0	4	2	5	2	1
06409....	14	76.4	10.6	+3.8	0	0	0	0	1	3	10	14	75.0	10.3	+3.5	0	0	0	1	2	1	10	14	75.2	10.3	+3.5	0	0	0	0	3	0	11
06411....	5	58.2	6.4	— .4	0	1	2	0	0	2	0	5	58.4	6.4	— .4	0	1	2	1	0	0	1	5	58.6	6.6	— .2	0	1	2	0	1	0	1
06412....	32	66.3	8.1	+1.3	0	0	1	7	7	12	5	33	68.0	8.5	+1.7	0	1	2	2	4	13	11	32	67.5	8.5	+1.7	0	0	1	3	10	10	8
06413....	35	59.6	6.8	0	0	3	11	10	6	3	2	35	64.0	7.6	+ .8	0	1	6	8	6	5	9	35	62.3	7.2	+ .4	0	1	7	10	8	4	5
06414....	22	67.1	8.3	+1.5	0	0	2	3	6	3	8	22	67.3	8.3	+1.5	0	1	2	2	2	6	9	22	66.9	8.3	+1.5	0	1	1	3	5	4	8
06415....	23	56.0	6.1	— .7	2	4	6	5	5	1	0	23	53.8	5.8	—1.0	3	5	4	6	2	3	0	23	55.2	5.9	— .9	1	5	6	5	4	2	0
06417....	10	61.9	7.2	+ .4	0	1	1	4	2	0	2	10	61.9	7.2	+ .4	0	0	3	2	3	1	1	10	61.7	7.2	+ .4	0	0	2	6	0	1	1
06418....	13	71.8	9.5	+2.7	0	0	0	2	2	2	7	13	76.5	10.9	+4.1	0	0	0	0	0	2	11	13	74.9	10.3	+3.5	0	0	0	0	1	3	9
06419....	43	69.2	8.8	+2.0	1	0	3	4	3	7	25	43	61.0	7.0	+ .2	8	2	4	6	2	6	15	43	65.3	7.8	+1.0	1	4	7	3	4	7	17
06420....	42	61.0	7.0	+ .2	1	3	11	6	9	8	4	42	63.8	7.6	+ .8	0	3	4	13	6	9	7	42	62.1	7.2	+ .4	1	2	7	11	7	7	7
07101....	37	62.9	7.4	+ .6	0	1	10	9	6	5	6	37	60.7	7.0	+ .2	3	3	6	10	1	6	8	35	62.7	7.4	+ .6	1	1	8	9	4	4	8
07116....	17	54.6	5.9	— .9	2	6	2	2	3	1	1	17	57.0	6.2	— .6	2	2	5	1	1	5	1	17	56.1	6.1	— .7	2	5	2	2	2	3	1
07117....	21	48.8	5.1	—1.7	6	7	5	1	0	2	0	21	45.3	4.7	—2.1	6	9	6	0	0	0	0	21	47.3	4.9	—1.9	6	7	6	2	0	0	0
07118....	61	61.9	7.2	+ .4	1	2	20	13	5	10	10	61	60.9	7.0	+ .2	2	8	12	11	4	14	10	61	61.6	7.2	+ .4	3	1	16	13	10	8	10
07119....	35	51.2	5.4	—1.4	4	12	10	8	1	0	0	35	53.6	5.8	—1.0	6	6	12	5	2	2	2	35	52.7	5.6	—1.2	3	10	12	5	3	2	0
07123....	46	64.9	7.8	+1.0	0	2	2	13	13	5	11	46	68.5	8.8	+2.0	0	1	3	7	4	14	17	46	66.8	8.3	+1.5	0	0	2	9	13	10	12
07124....	16	68.2	8.5	+1.7	0	0	2	2	1	6	5	16	69.8	9.0	+2.2	0	0	1	1	3	3	8	16	68.6	8.8	+2.0	0	0	1	1	3	6	5
07301....	35	55.3	5.9	— .9	3	6	9	11	3	3	0	35	57.2	6.2	— .6	3	9	6	5	4	1	7	35	56.5	6.2	— .6	2	8	6	9	4	5	1
07302....	15	62.2	7.2	+ .4	1	1	2	4	2	1	4	15	61.5	7.2	+ .4	2	2	2	1	0	3	5	15	61.6	7.2	+ .4	2	1	3	0	3	2	4
07303....	32	64.7	7.8	+1.0	0	1	4	11	3	6	7	33	65.2	7.8	+1.0	3	2	7	4	2	4	11	32	64.9	7.8	+1.0	0	2	5	7	7	2	9
07304....	14	64.0	7.6	+ .8	0	0	0	7	2	4	1	14	59.4	6.6	— .2	1	1	4	4	1	2	1	14	61.9	7.2	+ .4	0	1	1	5	5	1	1
07305....	11	62.7	7.4	+ .6	0	1	1	4	2	1	2	11	64.2	7.6	+ .8	1	1	0	2	1	0	6	11	63.7	7.6	+ .8	0	2	0	2	1	4	2
07306....	16	58.7	6.6	— .2	0	3	4	5	0	3	1	16	60.5	7.0	+ .2	1	1	3	5	1	2	3	16	59.8	6.8	0	0	3	2	6	0	3	2
07307....	12	62.1	7.2	+ .4	0	1	2	3	2	2	2	12	63.8	7.6	+ .8	0	1	2	2	3	1	3	12	62.8	7.4	+ .6	0	0	3	2	3	2	2

TABLE II—CONTINUED

School	Arithmetic computation										Arithmetic reasoning										Arithmetic average									
					Distribution										Distribution										Distribution					
	N	M	GE	D	−3	−2	−1	A	+1	+2	+3	N	M	GE	D	−3	−2	−1	A	+1	+2	+3	N	M	GE	D	−3	−2	−1	A	+1	+2	+3
07309....	18	64.4	7.6	+ .8	0	1	4	3	2	4	4	18	65.9	8.1	+1.3	0	2	5	0	1	3	7	18	65.4	7.8	+1.0	0	1	4	3	2	2	6
07310....	13	57.4	6.2	− .6	1	2	3	3	3	0	1	13	60.2	6.8	0	1	2	2	2	3	1	2	13	59.0	6.6	− .2	1	1	3	4	2	1	1
07311....	10	59.7	6.8	0	0	1	3	1	4	1	0	10	54.4	5.8	−1.0	2	1	1	5	0	0	1	10	56.8	6.2	− .6	1	1	2	4	1	1	0
07312....	12	64.8	7.8	+1.0	0	1	3	0	2	1	5	12	57.3	6.2	− .6	2	2	1	2	1	2	2	12	61.7	7.2	+ .4	0	3	1	1	1	4	2
07314....	5	74.0	10.0	+3.2	0	0	0	0	1	0	4	5	78.4	11.0	+4.2	0	0	0	0	0	1	4	5	76.0	10.6	+3.8	0	0	0	0	0	2	3
07315....	18	63.1	7.4	+ .6	1	0	2	3	4	4	4	18	64.1	7.6	+ .8	0	2	1	6	1	2	6	18	63.8	7.6	+ .8	0	2	1	7	2	1	5
08601....	16	67.4	8.3	+1.5	0	0	1	0	5	6	4	16	66.9	8.3	+1.5	0	2	0	2	2	3	7	16	67.0	8.3	+1.5	0	1	0	2	2	8	3
08602....	4	67.5	8.5	+1.7	0	0	1	0	1	0	2	4	64.3	7.6	+ .8	0	1	0	1	0	1	1	4	65.8	8.1	+1.3	0	0	1	0	1	0	2
08603....	6	62.3	7.2	+ .4	0	0	2	1	0	3	0	6	68.3	8.5	+1.7	0	0	1	1	0	0	4	6	65.7	8.1	+1.3	0	0	2	0	0	2	2
08605....	15	62.5	7.4	+ .6	1	0	3	1	6	2	2	15	63.7	7.6	+ .8	0	1	2	4	0	6	2	15	63.9	7.6	+ .8	1	0	1	4	2	6	1
08606....	11	56.2	6.1	− .7	0	1	6	3	1	0	0	11	58.4	6.4	− .4	0	2	4	2	0	2	1	11	57.1	6.2	− .6	0	1	6	1	2	1	0
08607....	7	54.6	5.9	− .9	0	2	2	3	0	0	0	7	51.0	5.4	−1.4	2	1	0	3	1	0	0	7	52.7	5.6	−1.2	1	1	3	2	0	0	0
08608....	5	45.0	4.7	−2.1	1	4	0	0	0	0	0	5	28.0	3.1	−3.7	5	0	0	0	0	0	0	5	36.2	3.8	−3.0	5	0	0	0	0	0	0
08609....	9	48.7	5.1	−1.7	3	1	2	3	0	0	0	9	49.0	5.1	−1.7	2	3	2	1	1	0	0	9	48.8	5.1	−1.7	3	1	3	2	0	0	0
08610....	9	54.3	5.8	−1.0	0	2	5	2	0	0	0	9	56.6	6.2	− .6	1	1	1	4	0	0	2	9	55.2	5.9	− .9	1	2	1	3	2	0	0
08611....	3	67.0	8.3	+1.5	0	0	1	0	0	0	2	3	62.0	7.2	+ .4	0	1	1	0	0	0	1	3	64.3	7.6	+ .8	0	0	1	0	1	0	1
08612....	9	72.0	9.5	+2.7	0	0	1	0	1	1	6	9	67.1	8.3	+1.5	0	1	1	0	2	1	4	9	69.4	8.8	+2.0	0	0	1	0	2	1	5
08613....	6	52.2	5.5	−1.3	1	0	5	0	0	0	0	6	52.5	5.6	−1.2	0	3	1	2	0	0	0	6	52.7	5.6	−1.2	0	1	3	2	0	0	0
08614....	3	72.3	9.5	+2.7	0	0	0	0	0	2	1	3	69.3	8.8	+2.0	0	0	0	1	0	0	2	3	70.7	9.3	+2.5	0	0	0	0	1	0	2
08615....	8	60.9	7.0	+ .2	0	1	0	5	1	0	1	8	66.8	8.3	+1.5	0	0	2	1	0	3	2	8	64.0	7.6	+ .8	0	0	1	2	3	1	1
08616....	3	56.3	6.1	− .7	0	1	0	2	0	0	0	3	59.3	6.6	− .2	0	1	0	0	1	1	0	3	58.0	6.4	− .4	0	1	0	0	2	0	0
09001....	27	50.9	5.4	−1.4	7	3	6	7	2	2	0	27	51.8	5.5	−1.3	4	8	5	5	3	1	1	27	51.6	5.5	−1.3	6	2	7	9	2	1	0
09002....	13	56.9	6.2	− .6	1	2	3	3	2	1	1	13	60.0	6.8	0	1	2	2	2	1	1	4	13	58.8	6.6	− .2	1	2	3	2	1	2	2
09003....	8	63.6	7.6	+ .8	0	0	0	4	2	1	1	8	64.1	7.6	+ .8	0	0	1	4	0	2	1	8	63.9	7.6	+ .8	0	0	0	5	2	0	1
09004....	17	62.4	7.2	+ .4	1	3	4	0	1	2	6	17	58.6	6.6	− .2	4	3	2	0	0	2	6	17	60.2	6.8	0	3	3	2	1	0	2	6
09009....	8	53.8	5.8	−1.0	1	0	4	2	1	0	0	8	56.0	6.1	− .7	1	1	3	1	1	0	1	8	55.3	5.9	− .9	1	0	3	3	0	1	0
09010....	19	59.6	6.8	0	3	0	2	5	4	2	3	19	62.4	7.2	+ .4	2	1	3	3	1	3	6	19	60.7	7.0	+ .2	3	0	2	4	4	3	3
09011....	18	65.9	8.1	+1.3	0	0	4	4	2	2	6	18	63.8	7.6	+ .8	0	0	5	2	2	7	2	18	65.1	7.8	+1.0	0	0	3	5	2	3	5
09012....	23	61.9	7.2	+ .4	1	0	3	8	4	3	4	23	63.3	7.4	+ .6	1	1	3	5	1	8	4	23	62.4	7.2	+ .4	1	1	2	7	5	3	4

6A PUPILS
SPECIAL

00501....	33	54.2	5.8	−1.0	0	11	13	9	0	0	0	30	53.6	5.8	−1.0	3	9	8	5	3	1	1	30	54.1	5.8	−1.0	0	11	10	6	2	1	0
01342....	21	68.3	8.5	+1.7	0	0	1	7	2	3	8	21	66.5	8.3	+1.5	0	2	2	2	2	5	8	21	67.0	8.3	+1.5	0	0	3	4	2	4	8
01402....	8	63.3	7.4	+ .6	0	0	1	3	0	4	0	8	57.8	6.4	− .4	0	1	2	3	2	0	0	8	60.3	6.8	0	0	0	2	3	3	0	0
01503....	2	73.0	9.8	+3.0	0	0	0	0	1	0	1	2	74.5	10.3	+3.5	0	0	0	0	0	1	1	2	74.0	10.0	+3.2	0	0	0	0	1	0	1
01508....	5	67.0	8.3	+1.5	0	0	1	0	1	1	2	5	69.2	8.8	+2.0	0	1	0	0	0	1	3	5	68.4	8.5	+1.7	0	0	1	0	0	1	3
01509....	9	57.4	6.2	− .6	0	2	2	3	1	1	0	9	52.1	5.5	−1.3	1	2	3	1	1	1	0	9	55.0	5.9	− .9	1	2	1	3	2	0	0
01510....	9	66.1	8.1	+1.3	0	3	0	0	0	2	4	9	64.0	7.6	+ .8	0	1	2	1	2	1	2	9	65.3	7.8	+1.0	0	1	2	0	0	3	3
01519....	22	60.4	6.8	0	1	2	4	5	4	3	3	22	60.8	7.0	+ .2	1	3	2	4	4	5	3	22	60.4	6.8	0	1	3	3	4	5	4	2
01524....	4	59.5	6.8	0	0	0	1	2	0	1	0	4	60.3	6.8	0	0	0	1	3	0	0	0	4	60.3	6.8	0	0	0	1	2	1	0	0
01525....	2	55.0	5.9	− .9	0	0	2	0	0	0	0	2	53.0	5.6	−1.2	0	1	1	0	0	0	0	2	54.0	5.8	−1.0	0	0	2	0	0	0	0
01733....	27	59.5	6.8	0	0	2	8	7	3	5	2	27	59.6	6.8	0	0	7	4	4	3	5	4	26	60.2	6.8	0	0	4	6	6	3	2	5
02605....	52	53.0	5.6	−1.2	6	10	20	12	2	2	0	52	54.5	5.9	− .9	6	12	10	12	5	6	1	52	54.0	5.8	−1.0	7	9	13	15	4	4	0
02706....	36	59.6	6.8	0	2	4	8	9	3	7	3	36	60.6	7.0	+ .2	1	6	7	7	5	1	9	36	60.3	6.8	0	1	4	8	8	5	5	5
02707....	11	64.5	7.8	+1.0	0	0	1	4	1	1	4	11	58.4	6.4	− .4	0	3	1	2	3	1	1	11	62.2	7.2	+ .4	0	1	2	2	1	4	1
03306....	46	58.4	6.4	− .4	1	5	14	15	3	5	3	46	58.1	6.4	− .4	3	10	8	8	6	5	6	46	58.3	6.4	− .4	0	7	13	11	6	5	4
05911....	42	55.5	6.1	− .7	2	10	8	17	2	3	0	42	57.3	6.2	− .6	2	9	8	11	6	3	3	42	56.6	6.2	− .6	2	9	7	16	4	2	2
06204....	7	72.6	9.8	+3.0	0	0	0	1	1	2	3	7	72.9	9.8	+3.0	0	0	0	0	1	2	4	7	72.6	9.8	+3.0	0	0	0	0	2	1	4
06213....	10	65.2	7.8	+1.0	0	0	1	2	2	3	2	10	67.9	8.5	+1.7	0	0	2	0	2	2	4	10	66.4	8.1	+1.3	0	0	0	3	2	2	3
06226....	9	66.2	8.1	+1.3	0	0	0	3	2	1	3	9	66.4	8.1	+1.3	0	0	0	6	0	0	3	9	64.7	7.8	+1.0	0	0	0	4	2	0	3
06227....	7	66.0	8.1	+1.3	0	1	0	1	1	1	3	7	69.3	8.8	+2.0	0	0	1	0	0	2	4	7	67.7	8.5	+1.7	0	0	1	0	2	1	3
07112....	54	57.3	6.2	− .6	2	7	17	14	3	10	1	54	57.6	6.4	− .4	3	9	13	10	7	9	3	54	56.6	6.2	− .6	3	8	13	13	9	6	2
07213....	44	58.5	6.6	− .2	2	6	6	11	13	6	0	44	58.7	6.6	− .2	3	7	4	8	13	6	3	44	58.4	6.4	− .4	2	7	6	10	15	4	0
07712....	27	58.5	6.6	− .2	2	2	9	7	0	3	4	27	59.1	6.6	− .2	4	3	7	1	1	4	7	27	58.5	6.6	− .2	2	4	8	2	5	1	5
08103....	39	59.8	6.8	0	2	1	9	11	8	5	3	39	63.4	7.4	+ .6	0	6	1	4	15	6	7	39	61.3	7.0	+ .2	2	3	4	10	10	5	5
08909....	50	58.3	6.4	− .4	2	5	17	10	6	7	3	50	57.7	6.4	− .4	6	7	12	6	4	7	8	50	58.3	6.4	− .4	3	7	14	9	6	6	5
08910....	7	66.7	8.3	+1.5	0	0	0	2	1	3	1	7	68.3	8.5	+1.7	0	0	0	1	2	1	3	7	67.9	8.5	+1.7	0	0	0	0	3	1	3
08911....	19	63.0	7.4	+ .6	1	1	2	5	2	4	4	19	60.9	7.0	+ .2	1	1	5	2	3	4	3	19	61.7	7.2	+ .4	1	1	2	6	4	2	3
11407....	24	67.1	8.3	+1.5	0	2	2	3	4	5	8	24	67.4	8.3	+1.5	0	2	3	2	5	3	9	24	67.0	8.3	+1.5	0	2	1	3	7	2	9
14103....	8	63.4	7.4	+ .6	0	1	1	2	0	1	3	8	66.3	8.1	+1.3	0	0	2	0	2	2	2	8	64.6	7.8	+1.0	0	1	1	1	1	2	2
14422....	29	64.6	7.8	+1.0	0	0	0	10	7	11	1	29	63.9	7.6	+ .8	0	2	3	9	3	5	7	29	64.1	7.6	+ .8	0	0	3	9	7	5	5
15902....	121	59.9	6.8	0	2	14	31	29	12	21	12	121	58.4	6.4	− .4	9	26	21	20	10	15	20	121	59.5	6.8	0	2	18	33	22	16	15	15
17003....	18	61.3	7.0	+ .2	2	0	3	4	1	5	3	18	64.3	7.6	+ .8	2	1	1	3	2	3	6	18	58.7	6.6	− .2	2	0	2	3	3	4	4

TABLE II—CONTINUED

School	Arithmetic computation											Arithmetic reasoning											Arithmetic average										
					Distribution											Distribution										Distribution								
	N	M	GE	D	−3	−2	−1	A	+1	+2	+3	N	M	GE	D	−3	−2	−1	A	+1	+2	+3	N	M	GE	D	−3	−2	−1	A	+1	+2	+3
6B PUPILS																																	
CITY																																	
10901....	42	59.3	6.6	+ .3	0	1	8	11	17	3	2	42	57.1	6.2	— .1	1	3	9	12	10	3	4	42	57.9	6.4	+ .1	0	1	12	11	12	3	3
10903....	14	60.3	6.8	+ .5	0	0	0	5	8	1	0	14	60.1	6.8	+ .5	0	0	2	4	5	2	1	14	60.1	6.8	+ .5	0	0	0	6	6	2	0
10904....	23	57.8	6.4	+ .1	0	1	5	7	9	1	0	23	57.9	6.4	+ .1	0	0	5	9	5	4	0	23	58.0	6.4	+ .1	0	0	4	10	7	2	0
10905....	6	61.7	7.2	+ .9	0	0	1	1	2	1	1	6	59.8	6.8	+ .5	0	0	2	0	1	3	0	6	61.0	7.0	+ .7	0	0	2	0	2	1	1
11402....	12	57.8	6.4	+ .1	0	1	1	5	4	1	0	12	62.2	7.2	+ .9	0	0	0	5	1	4	2	12	59.8	6.8	+ .5	0	0	2	4	4	2	0
11405....	22	45.7	4.8	−1.5	3	4	12	3	0	0	0	22	45.0	4.7	−1.6	5	4	7	6	0	0	0	22	45.1	4.7	−1.6	3	7	9	3	0	0	0
11703....	39	57.8	6.4	+ .1	0	2	7	15	10	4	1	39	56.0	6.1	— .2	0	4	13	10	7	3	2	39	57.1	6.2	— .1	0	1	9	18	6	3	2
12201....	27	58.7	6.6	+ .3	2	3	6	2	4	2	8	27	63.7	7.6	+1.3	1	2	5	2	2	1	14	27	61.0	7.0	+ .7	2	0	7	3	2	2	11
12301....	20	52.4	5.5	— .8	0	3	10	4	2	1	0	20	49.1	5.1	−1.2	2	6	7	2	2	1	0	20	50.9	5.4	— .9	0	7	7	3	3	0	0
12401....	14	55.1	5.9	— .4	2	0	3	3	4	2	0	14	60.5	7.0	+ .7	1	0	3	1	2	4	3	14	57.7	6.4	+ .1	1	1	3	0	5	3	1
12502....	16	55.1	5.9	— .4	0	0	7	7	0	1	1	16	49.5	5.2	−1.1	1	5	6	2	1	1	0	16	52.5	5.6	— .7	0	2	9	3	1	1	0
12503....	7	52.7	5.6	— .7	1	1	1	1	3	0	0	7	56.4	6.1	— .2	0	1	2	0	3	1	0	7	55.6	6.1	— .2	0	2	2	0	3	0	0
12504....	20	47.5	5.0	−1.3	1	10	4	5	0	0	0	20	47.6	5.0	−1.3	3	7	5	3	0	2	0	20	47.7	5.0	−1.3	2	7	7	2	2	0	0
12505....	11	54.0	5.8	— .5	0	0	6	4	1	0	0	11	54.5	5.9	— .4	0	1	4	4	0	2	0	11	54.5	5.9	— .4	0	0	5	4	2	0	0
13701....	11	50.4	5.2	−1.1	0	5	3	2	1	0	0	11	47.8	5.0	−1.3	3	1	4	1	1	1	0	11	49.4	5.1	−1.2	1	4	2	3	1	0	0
13702....	18	50.0	5.2	−1.1	1	4	8	5	0	0	0	18	48.1	5.0	−1.3	4	2	5	4	3	0	0	18	49.4	5.1	−1.2	0	7	4	6	1	0	0
13703....	12	60.9	7.0	+ .7	0	1	0	4	2	4	1	12	59.6	6.8	+ .5	2	0	1	2	2	1	4	12	60.6	7.0	+ .7	1	0	2	1	4	0	4
13803....	13	52.0	5.5	— .8	0	2	5	6	0	0	0	13	50.0	5.2	−1.1	1	5	1	4	1	1	0	13	51.2	5.4	— .9	0	5	3	3	2	0	0
14001....	21	54.3	5.8	— .5	0	4	5	9	3	0	0	22	53.6	5.8	— .5	1	5	5	3	5	1	2	22	53.7	5.8	— .5	0	6	5	4	3	3	1
14002....	27	49.0	5.1	−1.2	2	8	11	6	0	0	0	27	50.3	5.2	−1.1	2	8	7	4	6	0	0	27	49.5	5.2	−1.1	1	7	10	8	1	0	0
14003....	16	53.5	5.8	— .5	0	2	7	4	3	0	0	16	50.3	5.2	−1.1	1	4	5	4	1	1	0	16	51.8	5.5	— .8	0	3	9	1	3	0	0
14004....	23	49.5	5.2	−1.1	3	2	11	6	1	0	0	23	49.2	5.1	−1.2	4	5	5	5	2	2	0	23	49.6	5.2	−1.1	3	3	11	4	2	0	0
14301....	16	54.1	5.8	— .5	0	1	6	8	0	1	0	16	54.1	5.8	— .5	0	2	7	4	1	2	0	16	53.9	5.8	— .5	0	1	8	5	1	1	0
15401....	10	55.1	5.9	— .4	0	0	5	3	1	1	0	10	55.5	6.1	— .2	1	1	2	2	2	1	1	10	55.6	6.1	— .2	0	1	4	2	1	1	1
15403....	26	48.8	5.1	−1.2	2	8	10	2	4	0	0	26	53.2	5.6	— .7	3	6	4	5	1	5	2	26	50.9	5.4	— .9	2	7	6	6	3	1	1
15601....	44	59.3	6.6	+ .3	0	2	13	5	11	8	5	44	58.3	6.4	+ .1	0	8	10	3	6	8	9	44	59.0	6.6	+ .3	0	5	13	3	9	6	8
15604....	13	57.1	6.2	— .1	0	0	5	4	2	2	0	13	51.2	5.4	— .9	1	2	4	3	2	0	1	13	53.5	5.8	— .5	0	2	6	2	2	0	1
15605....	10	52.8	5.6	— .7	0	2	5	1	2	0	0	10	50.3	5.2	−1.1	1	4	1	1	1	1	1	10	51.8	5.5	— .8	1	2	3	1	1	2	0
16602....	18	55.6	6.1	— .2	0	3	3	7	4	1	0	18	53.1	5.6	— .7	2	3	4	1	5	2	1	18	54.1	5.8	— .6	0	3	6	5	3	0	1
16603....	10	58.9	6.6	+ .3	0	1	2	3	1	1	2	10	55.5	6.1	— .2	1	2	1	1	2	1	2	10	57.4	6.2	— .1	0	2	2	2	1	1	2

16604....	5	61.2	7.0	+ .7	0	0	0	2	2	1	0	5	64.2	7.6	+1.3	0	0	0	2	0	2	1	5	63.0	7.4	+1.1	0	0	0	2	1	1	1
16605....	21	53.4	5.6	— .7	0	5	5	5	6	0	0	21	48.3	5.0	—1.3	2	6	7	6	0	0	0	21	51.1	5.4	— .9	1	5	7	7	1	0	0
16606....	10	50.3	5.2	—1.1	1	2	2	4	1	0	0	10	50.2	5.2	—1.1	1	2	3	3	0	0	1	10	50.3	5.2	—1.1	1	1	3	5	0	0	0
16607....	24	68.8	8.8	+2.5	0	0	2	1	2	8	11	24	65.5	8.1	+1.8	0	0	2	3	5	6	8	24	66.8	8.3	+2.0	0	0	1	4	1	8	10
16608....	19	58.4	6.4	+ .1	0	1	4	5	6	1	2	19	58.0	6.4	+ .1	0	4	3	3	4	1	4	19	58.4	6.4	+ .1	0	1	6	7	0	3	2
16609....	14	52.8	5.6	— .7	1	2	3	6	2	0	0	14	54.3	5.8	— .5	1	2	4	1	4	1	1	14	53.5	5.8	— .5	1	0	5	3	4	1	0
16610....	18	57.6	6.4	+ .1	0	1	5	7	3	2	0	18	48.6	5.1	—1.2	0	4	13	1	0	0	0	18	53.3	5.6	— .7	0	2	9	4	3	0	0
16611....	14	62.3	7.2	+ .9	0	0	4	0	3	4	3	14	62.1	7.2	+ .9	0	2	2	2	2	2	4	14	61.9	7.2	+ .9	0	0	4	1	4	1	4
16612....	12	50.3	5.2	—1.1	1	4	4	0	3	0	0	12	54.0	5.8	— .5	1	1	5	2	1	1	1	12	52.4	5.5	— .8	1	1	6	1	2	1	0
17601....	12	54.6	5.9	— .4	0	0	7	3	2	0	0	12	52.4	5.5	— .8	1	2	4	2	2	1	0	12	53.8	5.8	— .5	0	1	6	3	2	0	0
17602....	24	49.4	5.1	—1.2	1	7	11	2	2	1	0	24	43.9	4.6	—1.7	7	8	5	0	3	0	1	24	46.5	4.9	—1.4	3	11	5	3	1	1	0
19301....	36	55.7	6.1	— .2	0	2	14	14	2	4	0	36	55.8	6.1	— .2	4	2	8	6	10	2	4	36	55.6	6.1	— .2	0	4	10	10	8	2	2
19801....	12	49.2	5.1	—1.2	0	4	6	2	0	0	0	12	45.6	4.8	—1.5	1	6	3	2	0	0	0	12	47.1	4.9	—1.4	0	5	6	1	0	0	0
20001....	14	54.4	5.8	— .5	0	2	5	4	1	1	1	14	53.0	5.6	— .7	0	3	6	1	3	0	1	14	53.8	5.8	— .5	0	3	5	3	2	0	1
20002....	8	49.8	5.2	—1.1	1	1	4	1	1	0	0	8	36.0	3.8	—2.5	4	3	1	0	0	0	0	8	42.6	4.5	—1.8	2	4	1	1	0	0	0
20003....	12	54.3	5.8	— .5	1	0	4	4	3	0	0	12	53.5	5.8	— .5	0	2	6	1	2	0	1	12	54.2	5.8	— .5	0	2	5	2	2	1	0
20901....	10	48.3	5.0	—1.3	1	2	6	0	1	0	0	10	49.0	5.1	—1.2	2	2	2	3	1	0	0	10	48.9	5.1	—1.2	1	2	3	3	1	0	0
20902....	11	54.1	5.8	— .5	0	2	5	1	3	0	0	11	54.2	5.8	— .5	0	3	3	1	0	3	1	11	54.5	5.9	— .4	0	3	3	1	1	3	0
20903....	12	47.0	4.9	—1.4	0	7	4	1	0	0	0	12	44.6	4.7	—1.6	3	4	2	2	1	0	0	12	46.0	4.8	—1.5	2	4	4	2	0	0	0
21201....	34	49.9	5.2	—1.1	0	9	17	6	2	0	0	34	46.9	4.9	—1.4	5	7	17	4	1	0	0	84	48.7	5.1	—1.1	1	11	15	7	0	0	0
21203....	20	54.5	5.9	— .4	1	3	7	1	7	1	0	20	51.3	5.4	— .9	2	4	5	5	3	0	1	20	53.2	5.6	— .7	1	4	6	1	6	2	0
22601....	11	51.5	5.5	— .8	0	3	4	3	0	1	0	11	55.5	6.1	— .2	0	0	6	2	2	1	0	11	53.6	5.8	— .5	0	1	6	1	2	1	0
22602....	7	52.4	5.5	— .8	0	1	4	2	0	0	0	7	51.1	5.4	— .9	1	1	1	3	1	0	0	7	52.1	5.5	— .8	0	1	5	1	0	0	0
22603....	6	48.2	5.0	—1.3	0	3	3	0	0	0	0	6	43.5	4.6	—1.7	1	4	1	0	0	0	0	6	45.8	4.8	—1.5	0	4	2	0	0	0	0
22604....	6	56.3	6.1	— .2	0	0	2	2	2	0	0	6	54.7	5.9	— .4	0	1	2	1	1	1	0	6	55.7	6.1	— .2	0	0	3	1	2	0	0
22605....	10	57.4	6.2	— .1	0	0	4	3	2	1	0	10	54.7	5.9	— .4	0	3	2	2	2	0	1	10	55.9	6.1	— .2	0	2	3	2	1	2	0

TABLE II—CONTINUED

School	Arithmetic computation												Arithmetic reasoning												Arithmetic average											
					Distribution												Distribution												Distribution							
	N	M	GE	D	−3	−2	−1	A	+1	+2	+3		N	M	GE	D	−3	−2	−1	A	+1	+2	+3		N	M	GE	D	−3	−2	−1	A	+1	+2	+3	
6B PUPILS TOWNSHIP																																				
01522....	6	54.0	5.8	— .5	0	2	1	1	1	1	0		6	59.7	6.8	+ .5	0	0	1	2	2	0	1		6	56.5	6.2	— .1	0	1	1	2	1	0	1
04928....	49	55.8	6.1	— .2	4	4	7	17	11	3	3		49	52.6	5.6	— .7	6	5	15	12	5	1	5		49	54.3	5.8	— .5	5	5	11	14	8	2	4
04931....	31	50.3	5.2	—1.1	3	8	6	8	6	0	0		31	52.2	5.5	— .8	4	7	5	6	5	2	2		31	51.5	5.5	— .8	2	8	6	7	5	1	2
04933....	52	53.6	5.8	— .5	4	2	15	23	6	1	1		52	56.4	6.1	— .2	2	4	12	11	12	8	3		52	55.4	5.9	— .4	2	4	15	13	12	5	1
04934....	30	57.3	6.2	— .1	2	1	2	13	10	1	1		30	57.8	6.4	+ .1	1	2	6	8	6	4	3		30	57.4	6.2	— .1	0	3	4	10	9	3	1
06214....	17	61.1	7.0	+ .7	0	1	4	1	3	5	3		17	58.4	6.4	+ .1	0	0	6	2	4	4	1		17	59.4	6.6	+ .3	0	1	4	1	6	4	1
06219....	10	60.4	6.8	+ .5	0	0	4	1	3	1	1		10	64.7	7.8	+1.5	0	0	3	1	1	0	5		10	62.2	7.2	+ .9	0	0	4	0	1	2	3
06228....	12	66.8	8.3	+2.0	0	0	2	0	3	2	5		12	65.3	7.8	+1.5	0	2	0	1	1	0	8		12	66.4	8.1	+1.8	0	2	0	0	2	1	7
6B PUPILS SPECIAL																																				
11407....	7	66.3	8.1	+1.8	0	0	0	0	2	4	1		7	69.1	8.8	+2.5	0	0	0	0	1	4	2		7	67.3	8.3	+2.0	0	0	0	0	2	3	2

33 pupils were 3 or more years below average; 10 were 2 years below; 5 were 1 year below; while only 2 pupils were as high as average. In arithmetic reasoning the group had an average equated score of 41.8 with a corresponding grade equivalent equal to that in computation. Eighteen, or more than half of the 33 pupils, were 3 or more years below average; 10 were 2 years below; and 5 were 1 year below average. Not one pupil in the group tested average or above in arithmetic reasoning. In arithmetic average the group also had a mean grade equivalent of 4.4 years, with 16 of the 33 pupils testing 3 or more years below average and none testing as high as average.

School 19002 is an example of a city group testing well above the test norm. The 40 pupils in this group made an average equated score of 80.4 with a corresponding grade equivalent of 11.0 years in arithmetic computation, which is 4.2 years above the test norm. All but 2 of the pupils were 3 or more years above average, and those 2 were 2 years above average. The group had an average equated score of 77.2 in arithmetic reasoning with a corresponding grade equivalent of 10.9 years, again more than 4 years above the test norm. All 40 pupils tested average or above, with 35 of them testing 3 or more years above average. In arithmetic average, the grade equivalent again was 11.0, 4.2 years above the test norm, and all but one of the 40 pupils were 3 or more years above average.

School 12505 is an example of a city school testing equal to the test norm. In arithmetic computation, the 26 pupils in this group made an average equated score of 60.0 with the corresponding grade equivalent of 6.8 years, which is the exact test norm. Of the 26 pupils, 2 were 2 years below average, 9 were 1 year below, 7 were average, 3 were 1 year above, 4 were 2 years above, and 1 was 3 or more years above average. In arithmetic reasoning, the group made an average equated score of 60.2, with the corresponding grade equivalent of 6.8, again the exact test norm. Four pupils were 2 years below average, 7 were 1 year below, 6 were average, 1 was 1 year above, 5 were 2 years above, and 3 were 3 or more years above average. In arithmetic average, the grade equivalent again equaled the test norm. Two pupils were 2 years below average, 7 were 1 year below, 7 were average, 6 were 1 year above, 3 were 2 years above, and 1 was 3 or more years above average.

In the city schools, the differences in individual achievement among pupils and in school achievement among the various schools were great. In some cases differences in individual achievement were so wide that individual instruction would seem to be a necessity. An analysis of the wide differences in achievement between schools should provide valuable information concerning the factors dominant in high and low pupil achievement in arithmetic.

Among the township schools, school 01213 is an interesting example of one testing very low in arithmetic. In arithmetic computation, the 12 pupils in this group made an average equated score of 31.3 with a corresponding grade equivalent of 3.4 years, which is 3.4 years below the test norm. Not one of the 12 pupils tested average or above; 9 were 3 or more years below average; 2 were 2 years

below; and 1 pupil was 1 year below average. In arithmetic reasoning, the 12 pupils made an even lower average score, 19.7, with a corresponding grade equivalent of 2.6 years, which is 4.2 years below the test norm. All 12 pupils, 100 per cent, were 3 or more years below the test norm. In arithmetic average, the group had an average equated score of 25.3 with a corresponding grade equivalent of 2.9 years, which is 3.9 years below the test norm. Eleven of the 12 pupils were 3 or more years below average and the other 1 was 2 years below average. As measured, this group was hardly up to the level of the average third grade group in arithmetic. The data in this study do not show why this group tested so low, but it seems that an analysis to determine the cause in such cases would be desirable.

Township school 06409 is an interesting example of a group testing well above the test norm. The 14 pupils in this group made an equated score of 76.4 in arithmetic computation with a corresponding grade equivalent of 10.6 years, which is 3.8 years above the test norm. As many as 10 pupils tested 3 or more years above average; 3 were 2 years above average; and 1 was 1 year above. None were average or below. In arithmetic reasoning, the average equated score was 75.0 and the corresponding grade equivalent was 10.3 years, 3.5 years above the test norm. Only 1 student tested average, 2 were 1 year above average, 1 was 2 years above, and 10 were 3 or more years above. In arithmetic average, the average grade equivalent of the group was 3.5 years above the test norm. Three of the pupils were 1 year above average and 11 pupils were 3 or more years above average. No pupils were average or below. When these two township schools, 01213 and 06409, are compared, a difference of 7.2 years is found between the two schools in arithmetic computation, of 7.7 years in arithmetic reasoning, and of 7.4 years in arithmetic average. This wide difference in arithmetic achievement between the two schools is typical of the extreme cases, and shows that the differences in arithmetic achievement between groups are similar to the extreme differences found within a single group. An analysis of all conditions affecting the achievement of groups that tested either well above or well below the norm should provide information helpful to all teachers of arithmetic.

The group of pupils in school 02011 is an interesting illustration of a group that tested exactly normal. On all three average test scores the grade equivalent was 6.8, which is the exact test norm. There was also, on all three tests, a well-balanced distribution of scores around the average. Even in this school, however, there was a difference in achievement of at least 5 years between the best and the poorest students. Such wide differences in achievement within the groups tend to make any but individual teaching difficult.

There were 802 6A pupils in 32 special schools who took the arithmetic test. Striking differences between schools and between individuals, similar to those in the township and city schools, were also found in the special schools, although there were far fewer schools represented. School 00501, for example, was a full year below the norm on all three tests, while school 08910 was at least 1.5 years

above the norm. In computation not one of the 33 pupils in school 00501 made a score above the norm, while in school 08910 not one fell below the norm. School 01519 made average grade equivalents equal to the norm on computation and average, and only .2 above on reasoning.

A total of 1,158 6B pupils were tested. The data for the 6B pupils follow those for 6A pupils in Table II. There were 944 6B pupils from 56 city schools, 207 from 8 township schools, and 7 from 1 special school. The differences in achievement between groups and between individuals among the 6B's were similar to those found among 6A pupils. In the city schools, school 11405 is an example of one with low arithmetic achievement as measured in this study. None of its pupils made a score above average on any of the tests, and its grade equivalent was at least a year and a half below the norm on all tests. School 10903 is an example of one equaling the norm, and school 16607 is an example of one well above the norm. Few of the city 6B schools made high average scores.

Although there were only 8 township schools in which 6B pupils took part in the study, the average achievement in computation varied 3.1 years between the highest (06228) and lowest (04931) schools, in reasoning it varied 2.3 years, and in arithmetic average 2.6 years.

The only 6B pupils from a special school came from one school. The average equated scores of this group were about 2 years above the norm on all three tests.

A study of the data in Table II shows the need for further analysis of the achievement in arithmetic of sixth grade pupils. In many of the schools the wide differences in achievement among the pupils would tend to make group teaching extremely difficult. The wide differences in achievement between schools also deserves careful study. The distribution of pupils in relation to the test norm shows that the grade placement of sixth grade pupils in arithmetic needs consideration.

In Table III are found the average equated scores, corresponding grade equivalents, and distribution of scores around the mean of the 6A and 6B pupils on each of the tests when grouped according to type of school.

On all tests both 6A's and 6B's in the city schools were not only below the norm, but they made lower scores than those in either the township or special schools. The 6A's in township schools were above the norm in computation and arithmetic average, but no other 6A group was above average on any of the tests. The 6A's from special schools equaled the norm on all of the tests. No 6A group made an average grade equivalent of more than .4 years from the norm. As a whole, the 6A pupils exactly met the norm in average arithmetic.

The 6B's from special schools were the only 6B's above the norm, and this group was about 2 years above. However, since only 7 pupils were in the group, and these came from the same school, they cannot be considered wholly representative of all 6B's from special schools. All other 6B pupils made average grade equivalents that were below the norm in all three tests, the city schools being

TABLE III. AVERAGE EQUATED SCORES, CORRESPONDING GRADE EQUIVALENTS, AND DISTRIBUTION OF SCORES AROUND THE AVERAGE MADE BY 6A AND 6B PUPILS GROUPED ACCORDING TO TYPE OF SCHOOL

	Number of schools	Number of pupils	Mean	GE	D	Distribution of scores							Per cent of scores		
						−3	−2	−1	A	+1	+2	+3	Below average	Average	Above average
6A PUPILS															
COMPUTATION															
City	190	6407	59.1	6.6	− .2	344	804	1497	1427	839	769	727	41	22	37
Township	199	2991	61.1	7.0	+ .2	113	284	603	675	398	415	503	33	23	44
Special	32	802	59.8	6.8	0	27	89	182	208	86	126	84	37	26	37
Total	421	10200	59.7	6.8	0	484	1177	2282	2310	1323	1310	1314	38	23	39
REASONING															
City	190	6398	58.4	6.4	− .4	505	1026	1351	1131	679	813	893	45	17	38
Township	199	2993	60.4	6.8	0	217	427	485	455	302	457	650	37	15	48
Special	32	799	59.7	6.8	0	45	131	134	135	112	107	135	39	17	44
Total	421	10190	59.1	6.6	− .2	767	1584	1970	1721	1093	1377	1678	43	17	40
AVERAGE															
City	190	6398	58.8	6.6	− .2	369	855	1435	1335	981	714	709	42	21	37
Township	199	2989	60.8	7.0	+ .2	143	338	538	567	481	404	518	34	19	47
Special	32	798	59.8	6.8	0	29	102	162	175	133	92	105	37	22	41
Total	421	10185	59.5	6.8	0	541	1295	2135	2077	1595	1210	1332	39	20	41
6B PUPILS															
COMPUTATION															
City	56	943	54.5	5.9	− .4	25	132	306	227	155	60	38	49	24	27
Township	8	207	55.9	6.1	− .2	13	18	41	64	43	14	14	35	31	34
Special	1	7	66.3	8.1	+1.8	0	0	0	0	2	4	1	0	0	100
Total	65	1157	54.8	5.9	− .4	38	150	347	291	200	78	53	46	25	29
REASONING															
City	56	944	53.3	5.6	− .7	77	167	249	165	128	79	79	52	18	30
Township	8	207	56.2	6.1	− .2	13	20	48	43	36	19	28	39	21	40
Special	1	7	69.1	8.8	+2.5	0	0	0	0	1	4	2	0	0	100
Total	65	1155	53.9	5.8	− .5	90	187	297	208	165	102	109	50	18	32
AVERAGE															
City	56	944	54.0	5.8	− .5	31	158	301	199	137	61	57	52	21	27
Township	8	207	56.2	6.1	− .2	9	24	45	47	44	18	20	37	23	40
Special	1	7	67.3	8.3	+2.0	0	0	0	0	2	3	2	0	0	100
Total	65	1158	54.4	5.8	− .5	40	182	346	246	183	82	79	49	21	30

consistently lower than the township schools. With the exception of the reasoning score made by the city schools, none of the 6B groups were more than half a year below the norm.

The distribution of scores of the city, township, and special schools was well balanced in all cases except that of the 6B special school, which, as has been pointed out, was an unusual group. Between 22 and 26 per cent of the 6A pupils made average scores on each of the tests. As many as 41 per cent of the city school pupils fell below the average, while only 33 per cent of those from township schools were below. An almost perfect balance of scores around the average was found in the special schools, where 37 per cent were above and 37 per cent below average.

In reasoning, 15 to 17 per cent of the pupils were at the norm. Again a larger per cent of city than of either township or special school pupils fell below the norm. In arithmetic average the same situation existed, with 19 to 22 per cent of the pupils making average scores.

Among the 6B's there was a wider discrepancy in the distribution of scores. One hundred per cent of the special students were above the norm on all three tests, and approximately 50 per cent of the city pupils were below the norm on all three tests. There was a much more normal distribution of scores among the township pupils on all three tests.

Comparison of Schools by Mean Scores

The distribution of schools in relation to average equated scores and corresponding grade equivalents is given in Table IV. Frequencies in arithmetic computation, reasoning, and average for the three types of schools—city, township, and special—and for both 6A and 6B are given.

Average equated scores for 6A's from the city schools in arithmetic computation ranged from a high of 79+ with a corresponding grade equivalent of 11.0+ to a low of 42 with a corresponding grade equivalent of 4.4 years, a difference in achievement in arithmetic computation of at least 6.6 years between the schools testing highest and lowest. Only 11, 6 per cent of the schools, made grade equivalents equal to the norm; 92, 48 per cent, were above the norm; and 87, 46 per cent, were below.

The highest average equated score made by 6A pupils from the township schools in arithmetic computation was 78 with a corresponding grade equivalent of 11.0 years and the lowest was 31 with a corresponding grade equivalent of 3.4 years, a difference of 7.6 years between the township schools testing highest and lowest. Twenty schools, 10 per cent, were at the norm; 116, 58 per cent, were above the norm; and 63, 32 per cent, were below.

Two special schools made an average equated score in arithmetic computation of 73 with a corresponding grade equivalent of 9.8 years. The lowest average equated score was 53 with a corresponding grade equivalent of 5.6 years, a difference of 4.2 years between the schools

TABLE IV. DISTRIBUTION OF SCHOOLS IN RELATION TO AVERAGE EQUATED SCORES AND CORRESPONDING GRADE EQUIVALENTS

Equated score	Grade equivalent	6A pupils												6B pupils											
		Computation				Reasoning				Average				Computation				Reasoning				Average			
		City	Township	Special	Total	City	Township	Special	Total	City	Township	Special	Total	City	Township	Special	Total	City	Township	Special	Total	City	Township	Special	Total
79+	11.0+	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
79	11.0+	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
78	11.0	0	1	0	1	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77	10.9	0	0	0	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76	10.6	0	1	0	1	0	2	0	2	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0
75	10.3	0	0	0	0	0	1	1	2	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0
74	10.0	0	1	0	1	0	1	0	1	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0
73	9.8	0	2	2	4	0	3	1	4	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
72	9.5	0	5	0	5	1	4	0	5	1	3	0	4	0	0	0	0	0	0	0	0	0	0	0	0
71	9.3	1	5	0	6	2	3	0	5	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0
70	9.0	1	3	0	4	1	3	0	4	2	3	0	5	0	0	0	0	0	0	0	0	0	0	0	0
69	8.8	3	3	0	6	1	5	2	8	1	5	0	6	1	0	0	1	0	0	1	1	0	0	0	0
68	8.5	1	7	1	9	1	6	2	9	1	5	3	9	0	0	0	0	0	0	0	0	0	0	0	0
67	8.3	7	8	3	18	6	8	2	16	4	6	2	12	0	1	0	1	0	0	0	0	1	0	1	2
66	8.1	10	7	3	20	9	5	2	16	12	10	1	23	0	0	1	1	1	0	0	1	0	1	0	1
65	7.8	12	14	3	29	14	10	0	24	14	10	3	27	0	0	0	0	0	2	0	2	0	0	0	0
64	7.6	18	18	0	36	16	25	3	44	9	20	1	30	0	0	0	0	2	0	0	2	0	0	0	0
63	7.4	11	11	3	25	9	12	1	22	17	16	0	33	0	0	0	0	0	0	0	0	1	0	0	1
62	7.2	15	21	0	36	11	14	0	25	14	22	2	38	2	0	0	2	2	0	0	2	1	1	0	2
61	7.0	12	9	1	22	7	12	3	22	14	10	1	25	2	1	0	3	1	0	0	1	3	0	0	3
60	6.8	11	20	6	37	8	8	2	18	10	11	6	27	1	1	0	2	3	1	0	4	2	0	0	2
59	6.6	11	11	2	24	17	12	2	31	8	14	2	24	4	0	0	4	0	0	0	0	1	1	0	2
58	6.4	9	4	2	15	11	6	6	23	15	9	3	27	5	0	0	5	3	2	0	5	4	0	0	4
57	6.2	13	8	2	23	12	16	1	29	12	5	2	19	2	1	0	3	1	0	0	1	2	2	0	4
56	6.1	12	10	1	23	11	7	0	18	10	6	0	16	3	1	0	4	6	1	0	7	5	0	0	5

55	5.9	9	8	1	18	12	5	1	18	10	8	1	19	5	0	0	5	3	0	0	3	2	1	0	3
54	5.8	9	4	1	14	8	5	1	14	7	7	3	17	7	2	0	9	6	0	0	6	9	1	0	10
53	5.6	4	2	1	7	2	5	1	8	8	5	0	13	4	0	0	4	3	1	0	4	3	0	0	3
52	5.5	7	3	0	10	9	2	1	12	3	4	0	7	4	0	0	4	1	1	0	2	4	1	0	5
51	5.4	3	4	0	7	4	3	0	7	4	1	0	5	0	0	0	0	3	0	0	3	4	0	0	4
50	5.2	2	1	0	3	4	1	0	5	4	1	0	5	7	1	0	8	6	0	0	6	3	0	0	3
49	5.1	1	4	0	5	2	3	0	5	2	1	0	3	4	0	0	4	4	0	0	4	4	0	0	4
48	5.0	2	0	0	2	2	2	0	4	2	0	0	2	3	0	0	3	4	0	0	4	1	0	0	1
47	4.9	2	1	0	3	4	0	0	4	2	2	0	4	1	0	0	1	1	0	0	1	2	0	0	2
46	4.8	1	0	0	1	1	1	0	2	0	1	0	1	1	0	0	1	1	0	0	1	2	0	0	2
45	4.7	0	1	0	1	0	2	0	2	0	0	0	0	0	0	0	0	2	0	0	2	1	0	0	1
44	4.6	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	2	0	0	2	0	0	0	0
43	4.5	1	0	0	1	1	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1
42	4.4	1	0	0	1	2	0	0	2	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
41	4.3	0	1	0	1	1	1	0	2	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
40	4.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	4.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	4.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	3.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	3.8	0	0	0	0	0	1	0	1	0	1	0	1	0	0	0	0	1	0	0	1	0	0	0	0
35	3.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	3.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	3.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	3.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	3.4	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	3.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	3.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	3.1	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	3.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	3.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	2.9	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
24	2.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	2.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	2.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	2.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	2.6	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

testing highest and lowest. Nineteen per cent of the special schools tested at the norm, 34 per cent above the norm, and 47 per cent below.

A city school tested highest in arithmetic computation and a township school tested lowest. The largest difference between high and low average grade equivalents (7.6 years) was in the township schools, the next largest (6.6 years) was in the city schools, and the smallest (4.2 years) was in the special schools. For all schools together the range in average grade equivalents was from a high of 11.0+ to a low of 3.4, a difference of 7.6 years in group achievement in arithmetic computation. As a total group, 37, 9 per cent of the 6A's, were average; 219, 52 per cent, were above average; and 74, 39 per cent, were below.

The range in grade equivalents for the city schools in arithmetic reasoning was from a high of 10.9 to a low of 4.3, a difference of 6.6 years; for the township schools, from a high of 11.0 to a low of 2.6, a difference of 8.4 years; and for the special schools, from a high of 10.3 to a low of 5.5, a difference of 4.8 years. The widest difference (8.4 years) between groups was found in the township schools, since both the highest and lowest average grade equivalents were made by township schools; and the smallest difference (4.8 years) between groups was found in the special schools. The range in average grade equivalents for all the schools was from a high of 11.0 to a low of 2.6, a difference of 8.4 years. Only from 4 to 6 per cent of the city pupils were at the norm on any of the tests; 55 per cent of the city pupils were below the norm; while only 37 per cent of the township pupils and 41 per cent of the special school pupils were below.

The range in average grade equivalents in average arithmetic in the 6A for all the city schools was from a high of 11.0+ to a low of 4.4, a difference of 6.6 years; for the township schools from 10.6 to 2.9, a difference of 7.7 years; for the special schools from 10.0 to 5.8, a difference of 4.2 years; and for all schools from 11.0+ to 2.9, a difference of at least 8.1 years in average arithmetic achievement. These data show that there was less variability in achievement in arithmetic among the special schools than among either the city schools or the township schools. The widest difference in achievement between groups for 6A pupils was in the township schools. Ten city schools, 5 per cent, equaled the test norm; 89 schools, 47 per cent, were above; and 91 schools, 48 per cent, were below the test norm. Among the township schools, 11 schools, 5 per cent, equaled the test norm; 121 schools, 61 per cent, were above; and 67 schools, 34 per cent, were below the norm. Six of the special schools, 19 per cent, equaled the norm; 15 schools, 47 per cent, were above the norm; and 11 schools, 34 per cent, were below. In all schools combined, 54 per cent made an average grade equivalent above the norm on each of the three tests; about 40 per cent fell below the norm; and only 6 per cent equaled the norm.

Among 6B pupils, the range in grade equivalents in city schools was from 8.8 to 4.8 in arithmetic computation, a difference of 4.0 years; for township schools, from 8.3 to 5.2, a difference of 3.1

years; and for the one special school, an average grade equivalent of 8.1 years. The range for all schools was from 8.8 to 4.8, a difference of 4.0 years between the highest and lowest in arithmetic computation. In arithmetic reasoning the range in average grade equivalents for city schools was from 8.1 to 3.8, a difference of 4.3 years; for township schools, from 7.8 to 5.5, a difference of 2.3 years; for the one special school, 8.8; and for all the schools, from 8.8 to 3.8, a difference of 5.0 years. The range in average grade equivalents for city schools in average arithmetic was from 8.3 to 4.5, a difference of 3.8 years; for township schools, from 8.1 to 5.5, a difference of 2.6 years; and for the one special school, 8.3. The range for all schools in average arithmetic was from 8.3 to 4.5, a difference of 3.8 years.

A comparison of the ranges in average grade equivalents of 6A's and 6B's in the different types of schools in arithmetic computation, reasoning, and average shows less wide difference in the 6B than in the 6A group. This may be explained in part by the fact that there were fewer 6B groups. None of the 6B schools made an average grade equivalent equal to the norm on any of the three tests. More than 70 per cent of the city schools were below normal on all tests. More than 60 per cent of the township schools were below in arithmetic computation and arithmetic average, while the same proportion were above average in arithmetic reasoning. The special school was above average on all scores. Since much the largest number of the 6B schools studied were city schools, the grade equivalents of the schools as a whole are similar to those of the city schools.

Comparison of Mean Scores of Various Groups

Age.—The average equated scores and corresponding grade equivalents in average arithmetic made by 6A and 6B girls and boys grouped according to age are given in Table V.

The highest average grade equivalent for 6A girls, 10.3 years, was made by one girl who was from 9 years to 9 years 5 months in age, and the lowest, 4.5, was made by those in the age interval from 15 years 6 months to 15 years 11 months. The highest average grade equivalent for 6A boys, 8.8, was made by those from 10 years to 10 years 5 months, and the lowest, 3.3, by one boy from 17 years to 17 years 5 months. The highest average grade equivalent, 10.3, was made by the youngest girl included in the study, and the lowest, 3.3, was made by the oldest boy.

The highest average grade equivalent for 6B girls, 6.8, was found in the age interval 10 years to 10 years 5 months, and the lowest, 3.8, in the interval 15 years 6 months to 15 years 11 months. For 6B boys the highest, 9.0, was made by one boy in the age interval 9 years to 9 years 5 months, and the lowest, 2.8 by one boy in the interval 16 years to 16 years 5 months. The highest and lowest average grade equivalents for boys were also the highest and lowest for both boys and girls.

In general, high achievement in both the 6A and 6B groups was associated with the younger pupils, and low achievement with the

TABLE V. AVERAGE EQUATED SCORES AND CORRESPONDING GRADE EQUIVALENTS IN AVERAGE ARITHMETIC FOR 6A AND 6B PUPILS GROUPED ACCORDING TO AGE

Age in years and months	Girls				Boys				Total			
	N	%	M	GE	N	%	M	GE	N	%	M	GE
6A PUPILS												
17-0—17-5	0	0	0	0	1	0	30.0	3.3	1	0	30.0	3.3
16-6—16-11	1	0	65.0	7.8	3	0	38.3	4.0	4	0	45.0	4.7
16-0—16-5	0	0	0	0	5	.1	54.6	5.9	5	.1	54.6	5.9
15-6—15-11	10	.2	42.7	4.5	21	.4	50.6	5.4	31	.3	48.0	5.0
15-0—15-5	24	.5	51.8	5.5	62	1.4	51.4	5.4	86	.9	51.5	5.5
14-6—14-11	36	.8	50.6	5.4	83	1.8	50.6	5.4	119	1.3	50.6	5.4
14-0—14-5	87	1.9	51.1	5.4	171	3.8	52.8	5.6	258	2.8	52.3	5.5
13-6—13-11	122	2.7	52.4	5.5	230	5.1	53.7	5.8	352	3.9	53.3	5.6
13-0—13-5	331	7.2	55.8	6.1	475	10.3	54.9	5.9	806	8.8	56.5	6.2
12-6—12-11	464	9.9	56.3	6.1	577	12.9	57.9	6.4	1041	11.4	57.2	6.2
12-0—12-5	1433	30.9	62.2	7.2	1265	28.3	62.2	7.2	2698	29.6	62.2	7.2
11-6—11-11	1685	36.3	61.7	7.2	1273	28.5	62.0	7.2	2958	32.5	61.8	7.2
11-0—11-5	325	6.9	62.3	7.2	223	5.0	62.2	7.2	548	6.0	62.3	7.2
10-6—10-11	102	2.2	63.5	7.6	71	1.6	59.7	6.8	173	1.9	62.0	7.2
10-0—10-5	20	.4	63.2	7.4	14	.3	68.5	8.8	34	.4	65.4	7.8
9-6—9-11	4	0	66.8	8.3	2	0	62.5	7.4	6	.1	65.3	7.8
9-0—9-5	1	0	75.0	10.3	0	0	0	0	1	0	75.0	10.3
8-6—8-11	0	0	0	0	0	0	0	0	0	0	0	0
8-0—8-5	0	0	0	0	1	0	51.0	5.4	1	0	51.0	5.4
7-6—7-11	0	0	0	0	1	0	62.0	7.2	1	0	62.0	7.2
6B PUPILS												
17-0—17-5	0	0	0	0	0	0	0	0	0	0	0	0
16-6—16-11	1	.2	50.0	5.2	0	0	0	0	1	.1	50.0	5.2
16-0—16-5	0	0	0	0	1	.2	23.0	2.8	1	.1	23.0	2.8
15-6—15-11	2	.4	35.5	3.8	4	.6	40.3	4.2	6	.5	38.7	4.1
15-0—15-5	1	.2	42.0	4.4	5	.8	43.4	4.5	6	.5	43.2	4.5
14-6—14-11	3	.6	40.3	4.2	13	2.0	45.9	4.8	16	1.4	44.9	4.7
14-0—14-5	10	2.0	43.0	4.5	30	4.7	46.4	4.8	40	3.5	45.5	4.8
13-6—13-11	18	3.6	47.7	5.0	41	6.4	48.0	5.0	59	5.2	47.9	5.0
13-0—13-5	29	5.8	49.9	5.2	77	11.9	51.0	5.4	106	9.3	50.7	5.4
12-6—12-11	37	7.5	51.9	5.5	80	12.5	52.6	5.6	117	10.4	52.4	5.5
12-0—12-5	116	23.4	56.3	6.1	125	19.5	55.2	5.9	241	21.1	55.7	6.1
11-6—11-11	139	28.1	57.0	6.2	153	23.8	56.7	6.2	292	25.7	56.8	6.2
11-0—11-5	118	23.8	57.3	6.2	88	13.7	58.8	6.6	206	18.1	57.9	6.4
10-6—10-11	16	3.2	53.6	5.8	19	2.9	56.7	6.2	35	3.1	54.7	5.9
10-0—10-5	6	1.2	60.0	6.8	5	.8	55.6	6.1	11	.9	58.0	6.4
9-6—9-11	0	0	0	0	0	0	0	0	0	0	0	0
9-0—9-5	0	0	0	0	1	.2	70.0	9.0	1	.1	70.0	9.0
8-6—8-11	0	0	0	0	0	0	0	0	0	0	0	0

older pupils. In both groups, also, there were more overage than underage pupils.

Length of School Year.—The average equated scores and corresponding grade equivalents for 6A and 6B pupils grouped according to the number of months in the school year are given in Table VI.

The 57 pupils enrolled in the one city school with a term of 8 months made an average grade equivalent of 7.2 years in arithmetic computation; no city schools with an 8½-month term participated in the study; the 4,693 pupils from 155 city schools with a 9-month term made an average grade equivalent of 6.8 years; the 571 pupils from 13 city schools with a school term of 9½ months made an average grade equivalent of 5.9 years; and the 1,086 pupils from 21 city schools with a 10-month school term made an average grade equivalent of

TABLE VI. AVERAGE EQUATED SCORES AND CORRESPONDING GRADE EQUIVALENTS FOR 6A AND 6B PUPILS GROUPED ACCORDING TO NUMBER OF MONTHS IN SCHOOL YEAR

Number of months in school year	6A pupils										6B pupils									
			Computation			Reasoning			Average				Computation			Reasoning			Average		
	Number of schools	Per cent of schools	Number of pupils	Mean	GE	Number of pupils	Mean	GE	Number of pupils	Mean	GE	Number of schools	Per cent of schools	Number of pupils	Mean	GE	Number of pupils	Mean	GE	Number of pupils	Mean	GE
CITY																						
8	1	.5	57	62.3	7.2	57	62.7	7.4	57	62.5	7.4	0	0	0	0	0	0	0	0	0	0	0
8½	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	155	81.6	4693	60.2	6.8	4686	59.7	6.8	4686	60.0	6.8	55	98.3	930	54.5	5.9	931	53.4	5.6	930	54.1	5.8
9½	13	6.8	571	55.2	5.9	569	54.3	5.8	569	54.7	5.9	1	1.7	13	52.0	5.5	13	50.0	5.2	13	51.2	5.4
10	21	11.1	1086	56.2	6.1	1086	54.8	5.9	1086	55.7	6.1	0	0	0	0	0	0	0	0	0	0	0
TOWNSHIP																						
8	158	79.4	1902	60.9	7.0	1903	60.0	6.8	1902	60.5	7.0	8	100.0	207	55.9	6.1	207	56.2	6.1	207	56.2	6.1
8½	10	5.0	350	59.7	6.8	350	60.4	6.8	348	60.3	6.8	0	0	0	0	0	0	0	0	0	0	0
9	31	15.6	739	62.3	7.2	740	61.6	7.2	739	62.0	7.2	0	0	0	0	0	0	0	0	0	0	0
9½	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SPECIAL																						
8	16	50.1	228	61.0	7.0	228	61.1	7.0	228	61.0	7.0	0	0	0	0	0	0	0	0	0	0	0
8½	1	3.1	52	53.0	5.6	52	54.5	5.9	52	54.0	5.8	0	0	0	0	0	0	0	0	0	0	0
9	13	40.6	475	59.6	6.8	472	59.4	6.6	471	59.6	6.8	1	100.0	7	66.3	8.1	7	69.1	8.8	7	67.3	8.3
9½	1	3.1	18	61.3	7.0	18	64.3	7.6	18	63.0	7.4	0	0	0	0	0	0	0	0	0	0	0
10	1	3.1	29	64.6	7.8	29	63.9	7.6	29	64.1	7.6	0	0	0	0	0	0	0	0	0	0	0
TOTAL																						
8	175	41.6	2187	61.0	7.0	2188	60.1	6.8	2187	60.6	7.0	8	12.3	207	55.9	6.1	207	56.2	6.1	207	56.2	6.1
8½	11	2.6	402	58.9	6.6	402	59.7	6.8	400	59.4	6.6	0	0	0	0	0	0	0	0	0	0	0
9	199	47.3	5907	60.4	6.8	5898	59.9	6.8	5896	60.2	6.8	56	86.2	937	54.6	5.9	938	53.5	5.8	937	54.2	5.8
9½	14	3.3	589	55.4	5.9	587	54.6	5.9	587	55.0	5.9	1	1.5	13	52.0	5.5	13	50.0	5.2	13	51.2	5.4
10	22	5.2	1115	56.4	6.1	1115	55.1	5.9	1115	55.9	6.1	0	0	0	0	0	0	0	0	0	0	0

6.1 years. Thus the highest average grade equivalent was made by pupils in an 8–month school, the next highest in 9-month schools, the next in 10-month schools, and the lowest in 9½-month schools.

The highest average grade equivalent in arithmetic computation (7.2) in the township schools was made in the 9-month schools, the next highest (7.0) in the 8-month schools, and the lowest (6.8) in the 8½-month schools. There were no participating township schools with terms of either 9½ or 10 months.

The highest average grade equivalent in arithmetic computation (7.8) in the special schools was in a 10-month school, the next highest (7.0) in both the 8- and 9½-month schools, the next (6.8) in the 9-month schools, and the lowest (5.6) in the 8½-month schools.

The average grade equivalents in arithmetic computation for all the 6A pupils, studied from highest to lowest, were: 8 months, 7.0; 9 months, 6.8; 8½ months, 6.6; 10 months, 6.1; and 9½ months, 5.9 years. These data indicate that an increase in length of school term does not necessarily increase achievement in arithmetic computation, and that factors other than the length of the school term modify achievement in this subject.

The highest average grade equivalent in the 6A in city schools in arithmetic reasoning was made by the 8-month school, 7.4, followed in order by 9-month schools, 6.8; 10-month schools, 5.9; and 9½-month schools, 5.8. There were no participating 8½-month city schools. In the township schools, those in 9-month schools made the highest average grade equivalent, 7.2, and those in both the 8- and 8½-month schools made 6.8. There were no participating township schools with terms of 9½ or 10 months. In the special schools the average grade equivalents were: 9½- and 10-month schools, 7.6; 8-month schools, 7.0; 9-month schools, 6.6; and 8½-month schools, 5.9. All the 6A pupils together made an average grade equivalent of 6.8 in the 8-, 8½-, and 9-month schools, and of 5.9 in the 9½-month and 10-month schools. These data indicate a negative correlation between length of school term and achievement in arithmetic reasoning, as the average grade equivalent for the 2,188 6A pupils in the 8-month schools was .9 years higher than that for the 1,115 pupils in the 10-month schools.

The average grade equivalents made by city schools in average arithmetic were: 8-month schools, 7.4; 9-month schools, 6.8; 10-month schools, 6.1; and 9½-month schools, 5.9 years. Those made by township schools were 7.2 in the 9-month schools, 7.0 in the 8-month schools, and 6.8 in the 8½-month schools. In the special schools, the 10-month schools were first, with a grade equivalent of 7.6, followed in order by 9½-month schools, 7.4; 8-month schools, 7.0; 9-month schools, 5.8; and 8½–month schools, 5.8 years.

A comparison of the results in average arithmetic in the 6A in schools of different length terms is interesting. Pupils in 8-month schools made the highest average grade equivalent, 7.0, which was .2 years above the test norm; those in the 9-month schools made an average grade equivalent of 6.8, which was exactly the same as the test norm; those in 8½-month schools made 6.6; those in 10-month schools made 6.1; and those in 9½-month schools made 5.9, .9 years below the test

norm. It is evident, therefore, that there is nothing in these data to indicate that achievement in arithmetic increases with the length of the school term. In fact, there is considerable evidence that achievement, as measured, tends to decrease with increase in the length of the school term.

The 6B sampling was small. The highest average grade equivalent made by all 6B's in average arithmetic, 6.1, was made by pupils in 8-month schools; the next highest, 5.8, by pupils in 9-month schools; and the lowest, 5.4, by pupils in 9½-month schools. There were no 6B participating schools whose terms were 8½ or 10 months in length. Pupils from the one special school, a 9-month school, made a grade equivalent of 8.3, but no other group was as high as the norm.

Number of Classrooms in Building.—The average equated scores and corresponding grade equivalents for 6A and 6B pupils grouped according to number of elementary classrooms in the building are given in Table VII.

TABLE VII. AVERAGE EQUATED SCORES AND CORRESPONDING GRADE EQUIVALENTS FOR 6A AND 6B PUPILS GROUPED ACCORDING TO NUMBER OF ELEMENTARY CLASSROOMS IN BUILDING

Number of rooms in building	Number of schools	Computation				Reasoning				Average			
		Number of pupils	Per cent of pupils	Mean	GE	Number of pupils	Per cent of pupils	Mean	GE	Number of pupils	Per cent of pupils	Mean	GE
6A PUPILS*													
10+	83	3298	36.0	58.6	6.6	3294	36.0	58.1	6.4	3291	36.0	58.4	6.4
9	12	399	4.0	58.6	6.6	399	4.0	58.7	6.6	399	4.0	58.7	6.6
8	35	1096	12.0	60.6	7.0	1095	12.0	59.6	6.8	1095	12.0	60.1	6.8
7	18	599	7.0	59.9	6.8	596	7.0	59.6	6.8	596	7.0	59.8	6.8
6	49	1374	15.0	61.4	7.0	1372	15.0	61.0	7.0	1371	15.0	61.3	7.0
5	15	273	3.0	60.9	7.0	273	3.0	60.5	7.0	273	3.0	60.7	7.0
4	62	1019	11.0	61.1	7.0	1019	11.0	60.2	6.8	1019	11.0	60.7	7.0
3	41	529	6.0	62.8	7.4	529	6.0	62.6	7.4	529	6.0	62.7	7.4
2	43	335	4.0	61.5	7.2	335	4.0	61.1	7.0	335	4.0	61.3	7.0
1	41	155	2.0	62.4	7.2	155	2.0	62.3	7.2	155	2.0	62.4	7.2
6B PUPILS													
10+	24	542	47.0	53.3	5.6	542	47.0	52.5	5.6	542	47.0	53.0	5.6
9	2	36	3.0	65.1	7.8	36	3.0	64.4	7.6	36	3.0	64.5	7.8
8	12	185	16.0	55.0	5.9	185	16.0	52.9	5.6	185	16.0	54.1	5.8
7	5	94	8.0	56.0	6.1	94	8.0	55.4	5.9	94	8.0	55.8	6.1
6	12	185	16.0	55.4	5.9	185	16.0	56.1	6.1	185	16.0	55.8	6.1
5	2	28	2.0	51.6	5.5	28	2.0	47.4	4.9	28	2.0	49.7	5.2
4	3	32	3.0	54.1	5.8	32	3.0	51.6	5.5	32	3.0	53.0	5.6
3	3	39	3.0	61.3	7.0	39	3.0	59.8	6.8	39	3.0	60.6	7.0
2	1	10	.5	60.4	6.8	10	.5	64.7	7.8	10	.5	62.2	7.2
1	1	6	.5	54.0	5.8	6	.5	59.7	6.8	6	.5	56.5	6.2

* 22 6A schools are not included because of incomplete data concerning number of rooms in building.

There were 3,298 6A pupils, 36 per cent, enrolled in 83 schools with 10 or more elementary classrooms in the building; 399, 4 per

cent, in 12 schools with 9 rooms each; 1,096, 12 per cent, in 35 schools with 8 rooms each; 599, 7 per cent, in 18 schools with 7 rooms each; 1,374, 15 per cent, in 49 schools with 6 rooms each; 273, 3 per cent, in 15 schools with 5 rooms each; 1,019, 11 per cent, in 62 schools with 4 rooms each; 529, 6 per cent, in 41 schools with 3 rooms each; 335, 4 per cent, in 43 schools with 2 rooms each; and 155, 2 per cent, in 41 one-room schools.

Fifty per cent of the 6B pupils were in schools with 9 or more elementary classrooms in the building, and only 1 per cent were in one- and two-room schools. No relationship between number of rooms in the building and achievement of pupils in arithmetic was evident in the data. However, so few 6B pupils from schools of fewer than 6 rooms were included in the study that the data cannot be considered wholly reliable.

Size of Class.—The average equated scores and corresponding grade equivalents for 6A and 6B pupils grouped according to size of class are given in Table VIII.

Size of classes for 6A pupils ranged from 1 to 51 or more pupils. Less than 1 per cent of the 6A pupils were in classes ranging from 1 to 5 students; 32 per cent were in classes of from 6 to 25; 39 per cent in classes of from 26 to 40; and 27 per cent in classes of from 41 to 51+. There were no 6B classes of only 1, 2, 3, or 4 pupils, and only one class of 5 pupils. Sixty-six per cent of the 6B pupils were in classes of from 6 to 25 pupils; 18 per cent were in classes of from 26 to 40 pupils; and 15 per cent were in classes of from 41 to 51 or more pupils. Differences in the achievement of different size classes in both 6A and 6B were for the most part small and inconsistent. In the 6A there was a slight tendency for those in smaller classes to make higher grade equivalents on all three tests, but in the 6B no trends were evident. It must therefore be assumed that the differences in achievement in arithmetic as measured in this study were largely due to factors other than the size of class.

Number of Grades in Classroom.—The average equated scores and corresponding grade equivalents for 6A and 6B pupils grouped according to the number of grades in the room are given in Table IX.

In the 6A, 70 per cent of the pupils were in classrooms in which the whole pupil group were 6A's, 23 per cent were in rooms in which 2 grades were enrolled, and 3 per cent or less were in rooms in which pupils in 3 or more grades were enrolled. While the differences in 6A achievement in relation to number of grades were small, it appears that pupils in a room only with others in the same grade tested lower than any of the others.

There were no 6B pupils in rooms with 5, 6, 7, or 8 grades. There were 28 pupils, 2 per cent, in 3 schools with 4 grades in a room; 56 pupils, 5 per cent, in 5 schools with 3 grades in a room; 380 pupils, 34 per cent, in 25 schools with 2 grades in a room; and 675 pupils, 59 per cent, in 32 schools in a room by themselves. Differences in achievement between groups in a room to themselves and those sharing a room with other grades indicate that in the 6B, also, those groups

TABLE VIII. AVERAGE EQUATED SCORES AND CORRESPONDING GRADE EQUIVALENTS FOR 6A AND 6B PUPILS GROUPED ACCORDING TO SIZE OF CLASS*

Number of pupils in class	Number of rooms having 6th grade	Computation				Reasoning				Average			
		Number of pupils	Per cent of pupils	Mean	GE	Number of pupils	Per cent of pupils	Mean	GE	Number of pupils	Per cent of pupils	Mean	GE
6A PUPILS													
51-..	12	709	7.0	60.1	6.8	709	7.0	60.0	6.8	709	7.0	60.0	6.8
46-50	11	497	5.0	58.8	6.6	497	5.0	58.7	6.6	497	5.0	58.8	6.6
41-45	33	1487	15.0	58.9	6.6	1485	15.0	57.9	6.4	1485	15.0	58.5	6.4
36-40	42	1649	17.0	59.4	6.6	1647	17.0	58.6	6.6	1645	17.0	59.1	6.6
31-35	33	1098	10.5	59.9	6.8	1099	10.5	58.7	6.6	1097	10.5	59.4	6.6
26-30	42	1189	12.0	58.5	6.6	1185	12.0	58.2	6.4	1184	12.0	58.4	6.4
21-25	40	893	9.0	60.5	7.0	893	9.0	60.1	6.8	893	9.0	60.4	6.8
16-20	54	985	9.5	61.0	7.0	985	9.5	60.8	7.0	985	9.5	60.8	7.0
11-15	67	885	9.0	60.8	7.0	884	9.0	59.3	6.6	885	9.0	60.2	6.8
6-10	56	450	5.0	61.9	7.2	448	5.0	61.3	7.0	448	5.0	61.7	7.2
5	12	60	.5	65.2	7.8	60	.5	66.5	8.3	60	.5	66.0	8.1
4	7	28	0	62.3	7.2	28	0	62.0	7.2	28	0	62.1	7.2
3	13	39	0	63.2	7.4	39	0	63.8	7.6	39	0	63.5	7.6
2	10	20	0	59.4	6.6	20	0	61.5	7.2	20	0	60.5	7.0
1	7	7	0	61.4	7.0	7	0	60.9	7.0	7	0	61.1	7.0
6B PUPILS													
51-..	1	52	4.5	53.6	5.8	52	4.5	56.4	6.1	52	4.5	55.4	5.9
46-50	1	49	4.0	55.8	6.1	49	4.0	52.6	5.6	49	4.0	54.3	5.8
41-45	2	86	7.0	59.3	6.6	86	7.0	57.7	6.4	86	7.0	58.4	6.4
36-40	1	39	3.0	57.8	6.4	39	3.0	56.0	6.1	39	3.0	57.1	6.2
31-35	2	65	5.0	50.1	5.2	65	5.0	49.4	5.1	65	5.0	50.0	5.2
26-30	4	110	10.0	53.6	5.8	110	10.0	56.3	6.1	110	10.0	54.8	5.9
21-25	6	134	12.0	51.6	5.5	134	12.0	50.0	5.2	134	12.0	51.0	5.4
16-20	12	240	21.0	56.4	6.1	240	21.0	53.8	5.8	240	21.0	55.1	5.9
11-15	22	256	22.0	54.9	5.9	256	22.0	54.7	5.9	256	22.0	54.8	5.9
6-10	14	121	11.0	54.5	5.9	121	11.0	53.2	5.6	121	11.0	53.9	5.8
5	1	5	.5	61.2	7.0	5	.5	64.2	7.6	5	.5	63.0	7.4
4	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0

* Number of rooms is used instead of number of schools because some schools had more than one sixth grade room. Some schools are not included because scores of several rooms were combined and size of class was therefore unknown.

sharing a room with other grades tested higher than those in a room to themselves.

Size of School.—The average equated scores and corresponding grade equivalents for 6A and 6B pupils grouped according to size of the school are given in Table X.

Of the 418 elementary schools for which data were complete concerning enrollment, the largest number of schools, 71, with 1,203 6A pupils, had an enrollment of 100 to 149. The largest number of 6A pupils, 2,280, were from 69 elementary schools with an enrollment of 200 to 299. Only 8 per cent of the 6A pupils were in schools with an enrollment of fewer than 100; 22 per cent from those of

TABLE IX. AVERAGE EQUATED SCORES AND CORRESPONDING GRADE EQUIVALENTS FOR 6A AND 6B PUPILS GROUPED ACCORDING TO NUMBER O.' GRADES IN ROOM

Number of grades in room	°Number of rooms having 6th grade	Computation				Reasoning				Average			
		Number of pupils	Per cent of pupils	Mean	GE	Number of pupils	Per cent of pupils	Mean	GE	Number of pupils	Per cent of pupils	Mean	GE
6A PUPILS													
8	29	143	1.0	60.6	7.0	143	1.0	61.5	7.2	143	1.0	61.2	7.0
7	5	8	0	64.9	7.8	8	0	61.5	7.2	8	0	63.4	7.4
6	3	6	0	63.7	7.6	6	0	63.2	7.4	6	0	63.5	7.6
5	2	6	0	65.0	7.8	6	0	71.0	9.3	6	0	68.0	8.5
4	36	239	2.0	60.5	7.0	239	2.0	60.1	6.8	239	2.0	60.4	6.8
3	33	312	3.0	61.7	7.2	310	3.0	60.4	6.8	310	3.0	61.1	7.0
2	132	2347	23.0	60.0	6.8	2347	23.0	59.1	6.6	2347	23.0	59.6	6.8
1	189	7139	70.0	59.5	6.8	7131	70.0	58.9	6.6	7126	70.0	59.3	6.6
6B PUPILS													
8	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0
4	3	28	2.0	54.7	5.9	28	2.0	59.0	6.6	28	2.0	56.8	6.2
3	5	56	5.0	56.6	6.2	56	5.0	53.5	5.8	56	5.0	55.2	5.9
2	25	380	34.0	55.6	6.1	379	34.0	53.4	5.6	379	34.0	54.6	5.9
1	32	675	59.0	54.3	5.8	676	59.0	54.1	5.8	676	59.0	54.2	5.8

° Number of rooms is used instead of number of schools because some schools had more than one sixth grade room.

100 to 199; 41 per cent from those of 200 to 449; and 29 per cent from those of 450 to 999. There were no marked differences in achievement for the 6A pupils in schools with an enrollment of fewer than 450, but the pupils in the largest schools, 450 to 999, tested considerably lower. On the whole, those in schools of from 50 to 200 made slightly higher scores than did any of the others. In that there was no definite trend among the smaller schools toward either low or high achievement in relation to size of schools, it would seem that the lower achievement of the pupils in the schools with an enrollment of 450 to 999 may have been due to factors other than the size of the school.

Of the 6B pupils, 38.5 per cent were in elementary schools with an enrollment of 300 to 449 and only 1 per cent were in schools with an enrollment of less than 100. Size of the school seems not to have been an important factor in the achievement of these 6B pupils. The 10 pupils in schools with an enrollment of 50 to 74 pupils made much the highest 6B average grade equivalent in arithmetic average, 7.2, but the sampling was too small to be significant. The pupils attending a school in the next smaller enrollment group tested a whole year lower, 6.2, than this group, and those in schools of 150 or more tested even lower.

Time Given to Study of Arithmetic.—The average equated scores and corresponding grade equivalents made by 6A and 6B pupils grouped

TABLE X. AVERAGE EQUATED SCORES AND CORRESPONDING GRADE EQUIVALENTS FOR 6A AND 6B PUPILS GROUPED ACCORDING TO SIZE OF SCHOOL*

Size of school	Number of schools	Computation				Reasoning				Average			
		Number of pupils	Per cent of pupils	Mean	GE	Number of pupils	Per cent of pupils	Mean	GE	Number of pupils	Per cent of pupils	Mean	GE
6A PUPILS													
600-999	24	1554	15.0	55.8	6.1	1551	15.0	54.7	5.9	1551	15.0	55.3	5.9
450-599	30	1378	14.0	58.2	6.4	1376	14.0	57.6	6.4	1376	14.0	57.9	6.4
300-449	56	1841	18.0	60.5	7.0	1841	18.0	59.9	6.8	1838	18.0	60.3	6.8
200-299	69	2280	23.0	59.8	6.8	2275	23.0	59.2	6.6	2274	23.0	59.6	6.8
150-199	44	974	10.0	62.0	7.2	974	10.0	61.6	7.2	974	10.0	61.9	7.2
100-149	71	1203	12.0	61.5	7.2	1203	12.0	60.8	7.0	1203	12.0	61.3	7.0
75- 99	30	311	3.0	62.9	7.4	311	3.0	62.5	7.4	311	3.0	62.7	7.4
50- 74	39	373	3.0	62.3	7.2	373	3.0	61.4	7.0	373	3.0	61.9	7.2
25- 49	38	180	1.5	61.2	7.0	180	1.5	61.4	7.0	180	1.5	61.3	7.0
1- 24	17	57	.5	60.9	7.0	57	.5	60.5	7.0	57	.5	60.7	7.0
6B PUPILS													
600-999	3	128	11.0	53.5	5.8	128	11.0	53.6	5.8	128	11.0	53.6	5.8
450-599	6	157	13.5	54.2	5.8	157	13.5	53.3	5.6	157	13.5	53.8	5.8
300-449	22	445	38.5	55.6	6.1	445	38.5	54.6	5.9	445	38.5	55.2	5.9
200-299	15	221	19.0	53.3	5.6	221	19.0	51.8	5.5	221	19.0	52.6	5.6
150-199	10	113	10.0	54.2	5.8	113	10.0	54.4	5.8	113	10.0	54.3	5.8
100-149	7	77	6.5	58.3	6.4	77	6.5	56.4	6.1	77	6.5	57.5	6.4
75- 99	0	0	0	0	0	0	0	0	0	0	0	0	0
50- 74	1	10	.5	60.4	6.8	10	.5	64.7	7.8	10	.5	62.2	7.2
25- 49	1	6	.5	54.0	5.8	6	.5	59.7	6.8	6	.5	56.5	6.2
1- 24	0	0	0	0	0	0	0	0	0	0	0	0	0

* Only 418 schools are included in this table because of incomplete data concerning the size of the remainder.

according to the time given daily to the study of arithmetic are given in Table XI.

These data show no marked differences in achievement in relation to the time given daily to the study of arithmetic. This holds true for the three types of schools—city, township, and special; for arithmetic computation, reasoning, and average arithmetic; and for both 6A and 6B pupils.

The time given daily to the study of arithmetic varied from 5 minutes to 99 minutes. The largest single group of 6A pupils, 3,965, enrolled in 122 schools, studied arithmetic 40 to 44 minutes daily and made an average grade equivalent of 6.2 years. Yet 17 pupils from one school, studying arithmetic 5 minutes daily, made an average grade equivalent of 6.8 years. A group of 56 pupils enrolled in 5 schools, studying arithmetic 95 to 99 minutes daily, made an average grade equivalent of 7.8 years. These data indicate that factors other than the time given daily to the study of arithmetic produce variations in achievement. These findings correspond with those concerning the length of the school term.

The average equated scores and corresponding grade equivalents made by 6A and 6B pupils grouped according to the time given weekly to the study of arithmetic are given in Table XII.

TABLE XI. AVERAGE EQUATED SCORES AND CORRESPONDING GRADE EQUIVALENTS FOR 6A AND 6B PUPILS GROUPED ACCORDING TO THE TIME GIVEN DAILY TO THE STUDY OF ARITHMETIC

Number of minutes each day	City					Township					Special					Total				
	Number of schools	Per cent of schools	Number of pupils	Mean	GE	Number of schools	Per cent of schools	Number of pupils	Mean	GE	Number of schools	Per cent of schools	Number of pupils	Mean	GE	Number of schools	Per cent of schools	Number of pupils	Mean	GE
6A PUPILS																				
95-99	1	.6	20	62.2	7.2	4	2.0	36	66.1	8.1	0	0	0	0	0	5	1.2	56	64.7	7.8
90-94	2	1.1	86	61.5	7.2	7	3.5	56	67.8	8.5	0	0	0	0	0	9	2.1	142	64.0	7.6
85-89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80-84	2	1.1	71	61.0	7.0	7	3.5	136	58.0	6.4	0	0	0	0	0	9	2.1	207	59.0	6.6
75-79	2	1.1	58	60.3	6.8	3	1.5	27	61.4	7.0	1	3.1	7	67.7	8.5	6	1.4	92	61.2	7.0
70-74	1	.6	42	56.3	6.1	3	1.5	109	62.1	7.2	0	0	0	0	0	4	1.0	151	60.5	7.0
65-69	1	.6	31	60.6	7.0	3	1.5	60	56.2	6.1	0	0	0	0	0	4	1.0	91	57.7	6.4
60-64	21	11.2	602	61.9	7.2	39	19.5	637	60.8	7.0	7	21.8	124	60.5	7.0	67	15.9	1363	61.3	7.0
55-59	8	3.6	310	61.6	7.2	6	3.0	134	63.7	7.6	0	0	0	0	0	14	3.3	444	62.3	7.2
50-54	20	15.9	895	61.0	7.0	10	5.0	196	57.4	6.2	4	12.5	140	59.7	6.8	44	10.5	1231	60.3	6.8
45-49	19	10.0	640	61.6	7.2	12	6.0	279	62.0	7.2	2	6.2	75	60.8	7.0	33	7.8	994	61.6	7.2
40-44	74	39.0	2904	56.4	6.1	40	20.0	764	59.7	6.8	8	25.0	297	58.7	6.6	122	29.0	3965	57.2	6.2
35-39	7	3.7	220	60.0	6.8	4	2.0	69	61.3	7.0	0	0	0	0	0	11	2.6	289	60.3	6.8
30-34	13	6.8	325	58.2	6.4	19	9.5	207	62.7	7.4	5	15.6	120	59.2	6.6	37	8.8	652	59.8	6.8
25-29	5	2.6	136	62.3	7.2	5	2.5	73	61.3	7.0	1	3.1	11	62.2	7.2	11	2.6	220	62.0	7.2
20-24	4	2.1	58	50.8	5.4	18	9.0	101	64.5	7.8	2	6.2	15	67.1	8.3	24	5.7	174	60.2	6.8
15-19	0	0	0	0	0	17	8.5	85	60.6	7.0	1	3.1	7	72.6	9.8	18	4.3	92	61.5	7.2
10-14	0	0	0	0	0	1	.5	3	71.3	9.3	1	3.1	2	54.0	5.8	2	.5	5	64.4	7.6
5- 9	0	0	0	0	0	1	.5	17	60.2	6.8	0	0	0	0	0	1	.2	17	60.2	6.8

6B PUPILS																				
95-99	2	3.5	30	51.3	5.4	0	0	0	0	0	0	0	0	0	0	2	3.1	30	51.3	5.4
90-94	1	1.7	42	57.9	6.4	0	0	0	0	0	0	0	0	0	0	1	1.5	42	57.9	6.4
85-89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80-84	0	0	0	0	0	1	12.5	49	54.3	5.8	0	0	0	0	0	1	1.5	49	54.3	5.8
75-79	1	1.7	20	50.9	5.4	0	0	0	0	0	0	0	0	0	0	1	1.5	20	50.9	5.4
70-74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65-69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60-64	13	23.2	174	51.9	5.5	1	12.5	52	55.4	5.9	0	0	0	0	0	14	21.5	226	52.7	5.6
55-59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50-54	10	17.8	203	52.6	5.6	0	0	0	0	0	1	100.0	7	67.3	8.3	11	16.9	210	53.1	5.6
45-49	6	10.7	86	54.4	5.8	1	12.5	30	57.4	6.2	0	0	0	0	0	7	10.8	116	55.2	5.9
40-44	16	28.5	242	55.9	6.1	1	12.5	31	51.5	5.5	0	0	0	0	0	17	26.3	273	55.4	5.9
35-39	3	5.3	84	54.2	5.8	1	12.5	12	66.4	8.1	0	0	0	0	0	4	6.2	96	55.7	6.1
30-34	3	5.3	52	55.9	6.1	1	12.5	17	59.4	6.6	0	0	0	0	0	4	6.2	69	56.8	6.2
25-29	1	1.7	11	53.6	5.8	0	0	0	0	0	0	0	0	0	0	1	1.5	11	53.6	5.8
20-24	0	0	0	0	0	1	12.5	10	62.2	7.2	0	0	0	0	0	1	1.5	10	62.2	7.2
15-19	0	0	0	0	0	1	12.5	6	56.5	6.2	0	0	0	0	0	1	1.5	6	56.5	6.2
10-14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5- 9	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TABLE XII. AVERAGE EQUATED SCORES AND CORRESPONDING GRADE EQUIVALENTS FOR 6A AND 6B PUPILS GROUPED ACCORDING TO THE TIME GIVEN WEEKLY TO THE STUDY OF ARITHMETIC

Number of minutes each week	City					Township					Special					Total				
	Number of schools	Per cent of schools	Number of pupils	Mean	GE	Number of schools	Per cent of schools	Number of pupils	Mean	GE	Number of schools	Per cent of schools	Number of pupils	Mean	GE	Number of schools	Per cent of schools	Number of pupils	Mean	GE
6A PUPILS																				
495- ..	1	.5	20	62.2	7.2	3	1.5	33	65.7	8.1	0	0	0	0	0	4	1.0	53	64.4	7.6
475-494 ..	0	0	0	0	0	1	.5	3	70.0	9.0	0	0	0	0	0	1	.2	3	70.0	9.0
455-474 ..	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
435-454 ..	2	1.1	86	61.5	7.2	6	3.0	54	68.4	8.5	0	0	0	0	0	8	1.9	140	64.1	7.6
415-434 ..	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
395-414 ..	1	.5	43	62.6	7.4	7	4.0	136	58.0	6.4	0	0	0	0	0	8	1.9	179	59.1	6.6
375-394 ..	1	.5	27	59.3	6.6	3	1.5	27	61.4	7.0	0	0	0	0	0	4	1.0	54	60.4	6.8
355-374 ..	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
335-354 ..	1	.5	42	56.3	6.1	4	2.0	111	61.9	7.2	0	0	0	0	0	5	1.2	153	60.4	6.8
315-334 ..	2	1.1	62	60.8	7.0	3	1.5	60	56.2	6.1	0	0	0	0	0	5	1.2	122	58.6	6.6
295-314 ..	18	9.5	541	62.4	7.2	39	19.0	637	60.8	7.0	9	28.1	175	60.3	6.8	66	15.7	1353	61.4	7.0
275-294 ..	8	4.2	307	61.7	7.2	6	3.0	134	63.7	7.6	0	0	0	0	0	14	3.3	441	62.3	7.2
255-274 ..	3	1.6	90	65.8	8.1	0	0	0	0	0	0	0	0	0	0	3	.7	90	65.8	8.1
235-254 ..	30	15.8	823	60.0	6.8	11	5.0	211	57.9	6.4	3	9.3	96	60.3	6.8	44	10.5	1130	59.6	6.8
215-234 ..	19	10.0	656	61.7	7.2	11	5.0	264	61.9	7.2	2	6.2	75	60.8	7.0	32	7.6	995	61.7	7.2
195-214 ..	72	37.9	2867	56.5	6.2	39	19.0	753	59.8	6.8	8	25.0	297	58.7	6.6	119	28.4	3917	57.3	6.2
175-194 ..	8	4.2	248	60.7	7.0	5	3.0	80	62.2	7.2	0	0	0	0	0	13	3.1	328	61.1	7.0
155-174 ..	3	1.6	108	54.3	5.8	0	0	0	0	0	0	0	0	0	0	3	.7	108	54.3	5.8
135-154 ..	12	6.3	284	58.9	6.6	20	10.0	212	62.3	7.2	5	15.6	120	59.2	6.6	37	8.8	616	60.1	6.8
115-134 ..	5	2.6	136	62.3	7.2	7	4.0	93	63.7	7.6	1	3.1	11	62.2	7.2	13	3.1	240	62.9	7.4
95-114 ..	4	2.1	58	50.8	5.4	15	8.0	76	61.7	7.2	2	6.2	15	67.1	8.3	21	5.0	149	58.0	6.4
75- 94 ..	0	0	0	0	0	17	9.0	87	60.9	7.0	1	3.1	7	72.6	9.8	18	4.3	94	61.8	7.2
55- 74 ..	0	0	0	0	0	1	.5	1	67.0	8.3	1	3.1	2	54.0	5.8	2	.5	3	58.3	6.4
35- 54 ..	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15- 34 ..	0	0	0	0	0	1	.5	17	60.2	6.8	0	0	0	0	0	1	.2	17	60.2	6.8

6B PUPILS

495-... ..	2	3.5	30	51.3	5.4	0	0	0	0	0	0	0	0	0	0	2	3.1	30	51.3	5.4
475-494 ..	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
455-474 ..	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
435-454 ..	1	1.7	42	57.9	6.4	0	0	0	0	0	0	0	0	0	0	1	1.5	42	57.9	6.4
415-434 ..	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
395-414 ..	0	0	0	0	0	1	12.5	49	54.3	5.8	0	0	0	0	0	1	1.5	49	54.3	5.8
375-394 ..	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
355-374 ..	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
335-354 ..	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
315-334 ..	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
295-314 ..	12	21.4	162	52.3	5.5	1	12.5	52	55.4	5.9	0	0	0	0	0	13	20.0	214	53.0	5.6
275-294 ..	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
255-274 ..	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
235-254 ..	11	19.6	215	52.2	5.5	0	0	0	0	0	1	100.0	7	67.3	8.3	12	18.5	222	52.7	5.6
215-234 ..	5	8.9	72	53.3	5.6	1	12.5	30	57.4	6.2	0	0	0	0	0	6	9.2	102	54.5	5.9
195-214 ..	17	30.3	256	56.1	6.1	1	12.5	31	51.5	5.5	0	0	0	0	0	18	27.8	287	55.6	6.1
175-194 ..	4	7.1	120	54.6	5.9	1	12.5	12	66.4	8.1	0	0	0	0	0	5	7.7	132	55.7	6.1
155-174 ..	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
135-154 ..	2	3.5	16	56.8	6.2	1	12.5	17	59.4	6.6	0	0	0	0	0	3	4.6	33	58.1	6.4
115-134 ..	2	3.5	31	51.8	5.5	0	0	0	0	0	0	0	0	0	0	2	3.1	31	51.8	5.5
95-114 ..	0	0	0	0	0	1	12.5	10	62.2	7.2	0	0	0	0	0	1	1.5	10	62.2	7.2
75- 94 ..	0	0	0	0	0	1	12.5	6	56.5	6.2	0	0	0	0	0	1	1.5	6	56.5	6.2
55- 74 ..	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35- 54 ..	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15- 34 ..	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

It seemed desirable to study the relation of achievement to the weekly as well as the daily time given to arithmetic, as some schools did not teach arithmetic every day, and therefore time given daily to the study of arithmetic would not be an accurate evaluation of the time given weekly. The data in Table XII show no more marked trends in achievement in relation to the time given weekly to the study of arithmetic than do the data concerning time given daily. The range in time given weekly was from 15 to 495 or more minutes per week. These data furnish further evidence, since trends are lacking, that factors other than daily or weekly time given to the study are largely responsible for the variations in achievement.

Departmentalization of Arithmetic.—The average equated scores and corresponding grade equivalents made by 6A and 6B pupils grouped according to whether or not arithmetic is departmentalized are given in Table XIII.

The average grade equivalent in arithmetic computation for the 3,976 pupils enrolled in the 6A grade in 101 city schools with de-

TABLE XIII. AVERAGE EQUATED SCORES AND CORRESPONDING GRADE EQUIVALENTS FOR 6A AND 6B PUPILS GROUPED ACCORDING TO WHETHER OR NOT ARITHMETIC WAS DEPARTMENTALIZED

	Number of schools	Number of schools	Computation			Reasoning			Average		
			Number of pupils	Mean	GE	Number of pupils	Mean	GE	Number of pupils	Mean	GE
6A PUPILS											
CITY*											
Departmentalized	101	53.4	3976	58.0	6.4	3970	57.3	6.2	3970	57.7	6.4
Nondepartmentalized	88	46.6	2371	60.9	7.0	2368	60.1	6.8	2368	60.6	7.0
TOWNSHIP											
Departmentalized	22	11.1	657	59.3	6.6	657	59.4	6.6	655	59.3	6.6
Nondepartmentalized	177	88.9	2334	61.6	7.2	2336	60.6	7.0	2334	61.3	7.0
SPECIAL											
Departmentalized	8	25.0	260	58.0	6.4	257	58.5	6.6	256	58.4	6.4
Nondepartmentalized	24	75.0	542	60.6	7.0	542	60.5	7.0	542	60.4	6.8
TOTAL											
Departmentalized	131	31.2	4893	58.2	6.4	4884	57.7	6.4	4881	58.0	6.4
Nondepartmentalized	289	68.8	5247	61.2	7.0	5246	60.4	6.8	5244	60.9	7.0
6B PUPILS											
CITY											
Departmentalized	23	41.1	485	54.3	5.8	486	52.8	5.6	485	53.6	5.8
Nondepartmentalized	33	58.9	458	54.7	5.9	458	53.9	5.8	458	54.4	5.8
TOWNSHIP											
Departmentalized	4	50.0	127	55.5	6.1	127	54.5	5.9	127	55.0	5.9
Nondepartmentalized	4	50.0	80	56.5	6.2	80	59.0	6.6	80	58.0	6.4
SPECIAL											
Departmentalized	0	0	0	0	0	0	0	0	0	0	0
Nondepartmentalized	1	100	7	66.3	8.1	7	69.1	8.8	7	67.3	8.3
TOTAL											
Departmentalized	27	41.5	612	54.6	5.9	613	53.1	5.6	612	53.9	5.8
Nondepartmentalized	38	58.5	545	55.1	5.9	545	54.9	5.9	545	55.1	5.9

* One school is not included because of incomplete data.

partmentalized arithmetic was 6.4 years, which was .6 years below the average grade equivalent (7.0) for the 2,371 pupils enrolled in 88 city schools where arithmetic was not departmentalized. The same difference in favor of the nondepartmentalized schools was found in the township and special schools also, as well as in all schools together.

In each type of school the average grade equivalents in arithmetic reasoning and in average arithmetic were from .4 to .6 years higher in nondepartmentalized schools than in departmentalized schools. These data show definitely that achievement for 6A pupils is higher in nondepartmentalized arithmetic than in departmentalized.

The superiority of nondepartmentalized arithmetic over departmentalized is much less marked among the 6B pupils. The average grade equivalent in arithmetic computation for the city nondepartmentalized schools was only .1 years higher than for the departmentalized; in arithmetic reasoning, it was .2 years higher; and in average arithmetic there was no difference between the two. In the township schools the average equated score in computation for nondepartmentalized schools was .1 years above that for departmentalized; in reasoning, .7 years above; and in average arithmetic, .5 years higher. The only participating special school was not departmentalized.

In the total 6B group the average grade equivalents for departmentalized and nondepartmentalized schools were the same (5.9) in computation, but nondepartmentalized schools were .3 years higher in reasoning and .1 years higher in average arithmetic. Where differences in average grade equivalents existed, the higher grade equivalents were always associated with nondepartmentalized arithmetic.

Congressional Districts.—The average equated scores and corresponding grade equivalents made by the 6A and 6B pupils grouped according to the congressional district[1] in which the schools are located in the state are given in Table XIV.

One frequently hears the statement that schools are better in one area of the state than in another. The statement "better schools" may refer to better buildings, higher teacher salaries, or any other factor or group of factors. In light of these statements it seemed advisable to study arithmetic achievement in relation to the area in the state in which the schools were located. Congressional districts seemed to provide a suitable division of the state into areas for study. Although Table XIV gives the data for computation, reasoning, and arithmetic average, the discussion of the relation of achievement to district will be limited to that shown by the grade equivalents in arithmetic average for 6A and 6B pupils.

The highest average equated score, 7.6 years, was made by the 700 6A pupils enrolled in 32 schools in District 2. The average achievement of the 6A pupils from this district was .8 years above the test norm. District 2, in the northwest part of the state, includes the following counties: Benton, Carroll, Cass, Fulton, Jasper, Kosciusko, Newton, Porter, Pulaski, Starke, Tippecanoe, and White.

Four congressional districts, 4, 6, 9, and 11, made identical aver-

[1] Information concerning congressional districts in Indiana was obtained from the *Year Book of the State of Indiana*, 1942, pp. 1121-34.

TABLE XIV. AVERAGE EQUATED SCORES AND CORRESPONDING GRADE EQUIVALENTS FOR 6A AND 6B PUPILS GROUPED ACCORDING TO THE CONGRESSIONAL DISTRICTS IN WHICH THE SCHOOLS WERE LOCATED

District	6A pupils									6B pupils								
	Number of schools	Computation			Reasoning			Average			Computation			Reasoning			Average		
		Number of pupils	M	GE	Number of pupils	M	GE	Number of pupils	M	GE	Number of schools	Number of pupils	M	GE	Number of pupils	M	GE	Number of pupils	M	GE
1	25	1195	57.1	6.2	1195	56.2	6.1	1195	56.8	6.2	2	36	50.6	5.4	36	53.8	5.8	36	52.2	5.5
2	32	702	63.5	7.6	702	64.0	7.6	700	63.8	7.6	0	0	0	0	0	0	0	0	0	0
3	30	1074	60.3	6.8	1074	60.1	6.8	1072	60.2	6.8	0	0	0	0	0	0	0	0	0	0
4	35	664	61.0	7.0	664	60.8	7.0	664	60.9	7.0	2	30	54.4	5.8	30	57.1	6.2	30	55.7	6.1
5	75	1378	60.6	7.0	1375	59.7	6.8	1375	60.2	6.8	29	434	55.3	5.9	434	53.6	5.8	434	54.6	5.9
6	50	757	61.7	7.2	756	60.2	6.8	756	60.9	7.0	1	20	52.4	5.5	20	49.1	5.1	20	50.9	5.4
7	26	886	58.9	6.6	886	57.6	6.4	886	58.2	6.4	4	80	55.2	5.9	80	55.0	5.9	80	55.1	5.9
8	44	1192	57.2	6.2	1188	56.4	6.1	1188	56.8	6.2	6	91	58.2	6.4	91	58.7	6.6	91	58.3	6.4
9	35	595	61.1	7.0	595	60.7	7.0	595	61.0	7.0	12	217	55.3	5.9	217	54.0	5.8	217	54.6	5.9
10	61	1513	59.2	6.6	1511	58.7	6.6	1510	59.0	6.6	5	87	50.9	5.4	87	48.8	5.1	87	50.1	5.2
11	8	244	61.1	7.0	244	60.3	6.8	244	60.8	7.0	4	162	54.3	5.8	162	54.7	5.9	162	54.6	5.9

age grade equivalents of 7.0 years. There were 664 6A pupils included in the study who attended 35 schools in District 4, which is in the northeastern corner of Indiana and is made up of Adams, Allen, DeKalb, LaGrange, Noble, Steuben, Wells, and Whitley counties.

In District 6 (Boone, Fountain, Hamilton, Hendricks, Montgomery, Parke, Putnam, Vermillion, Vigo, and Warren counties), in the north central part of the state, 756 pupils in the study were from 50 schools; in District 9 (Bartholomew, Brown, Dearborn, Franklin, Jackson, Jefferson, Jennings, Lawrence, Ohio, Orange, Ripley, Scott, Switzerland, and Washington counties), located in the south central part, 595 pupils were enrolled in 35 schools; and in District 11, which includes Marion County only, 244 pupils were enrolled in 8 schools.

Two districts, 3 and 5, made the exact test norm. District 3, which is in the northern part of the state and includes Elkhart, LaPorte, Marshall, and St. Joseph counties, was represented by 1,072 6A pupils from 30 schools; and District 5, just south of District 3, which includes Blackford, Clinton, Grant, Howard, Huntington, Jay, Madison, Miami, Tipton, and Wabash counties, was represented by 1,375 pupils from 75 schools.

In District 10 (Decatur, Delaware, Fayette, Hancock, Henry, Randolph, Rush, Shelby, Union, and Wayne counties) in the eastern section of Indiana, the 1,510 pupils enrolled in 61 schools made an average grade equivalent of 6.6 years, which is .2 years below the test norm.

The 886 pupils enrolled in 26 schools in District 7 made an average grade equivalent of 6.4 years, which is .4 years below the test norm. District 7 is in the southwestern central part of the state and includes Clay, Daviess, Gibson, Greene, Johnson, Knox, Martin, Monroe, Morgan, Owen, and Sullivan counties.

The pupils from Districts 1 and 8 made identical average grade equivalents, 6.2 years, .6 years below the test norm. District 1 includes Lake county only, and District 8, in the southeastern corner of the state, includes Clark, Crawford, Dubois, Floyd, Harrison, Perry, Pike, Posey, Spencer, Vanderburgh, and Warrick counties.

There are differences in achievement of 6A pupils in relation to the area of the state in which their school is located, but the data in this study give no information as to why they differ. It must be remembered that within each district there are schools that score both high and low just as there are individual pupils who score both high and low within a single school.

There were no 6B pupils from Districts 2 and 3 included in the study. The 6B pupils of District 8 made the highest average grade equivalents (6.4 in computation and average arithmetic and 6.6 in reasoning), but those in none of the other districts were as high as the norm. No trends were evident in these data.

SUMMARY

The Stanford Intermediate Arithmetic Test, Form DM, was given to 10,200 6A and 1,158 6B pupils, a total of 11,358 pupils enrolled in 486 elementary schools well distributed over the state of Indiana.

The norm grade equivalent for 6A pupils is 6.8 years, and for 6B pupils, 6.3 years. The majority of the tests were given during the period April 16 to May 15, 1943. Test scores were processed by the Hollerith technique. Achievement of pupils was studied in relation to the deviation from the test norm, and achievement of groups was studied in relation to the average grade equivalent of the group and the distribution of pupils within the group around the test norm. Some of the more important findings of the testing are:

1. There were great individual differences in achievement in arithmetic as shown by this testing. In most of the groups there was a difference of 4 or more years between the pupil testing highest and the one testing lowest. Such wide differences in achievement within groups would, it seems, make group instruction difficult if not impossible.

2. There were wide differences in average achievement between groups. These differences, ranging as high as 7 years, were so great that analyses should be made to determine the reasons for the very low average achievement of some groups and the very high achievement of others.

3. The average achievement of both 6A and 6B pupils in the township and special schools was above that in the city schools.

4. In general, high achievement in both 6A and 6B groups was associated with younger pupils and low achievement was associated with the older pupils. In both groups, also, there were more overage than underage pupils.

5. The results of the study did not show superiority in achievement in schools with longer terms—in fact, as measured by this study, arithmetic achievement tended to decrease with increase in length of school term.

6. No relationship was found between the number of rooms in the elementary school and pupil achievement in arithmetic in the 6B, but in the 6A there was a slight tendency for those in smaller schools to make higher scores on the tests.

7. Size of class seems not to have been a factor in modifying achievement in the 6B, but in the 6A the larger classes made slightly lower average equated scores than did the smaller classes.

8. The number of elementary grades in the room seems not to have been an important factor in modifying achievement, although rooms in which only 6A pupils were enrolled tended to make lower average equated scores than did those in rooms with other grades.

9. The results of this study showed no marked differences in achievement in relation to the time given daily or weekly to the study of arithmetic.

10. Achievement in the 6A was definitely higher in nondepartmentalized arithmetic than in departmentalized. The superiority of nondepartmentalized arithmetic over departmentalized was less marked among the 6B pupils.

11. There were differences in achievement of 6A pupils in relation to the area of the state in which their school is located, but no trends were evident in either 6A or 6B scores.

A List of Bulletins in the Field of Education, Indiana University

By Kathleen Dugdale

The School of Education at Indiana University has published the following bulletins. All of these may be obtained from the University Bookstore for 50 cents postpaid unless otherwise noted.

Proceedings of the High School Principals' Conference (November 23 and 24, 1923). Vol. I, No. 1, 1924. 85 p. (Supply exhausted.)

Investigation of Nursing as a Professional Opportunity for Girls, Part I, Technical Study; Part II, Vocational Information Bulletin. By Florence E. Blazier. Vol. I, No. 2, 1924. 69 p.

Proceedings of the Eleventh Conference on Educational Measurements. Vol. I, No. 3, 1925. 141 p.

Proceedings of the High School Principals' Conference (November 14 and 15, 1924). Vol. I, No. 4, 1925. 49 p. (Supply exhausted.)

First Revision of the Bibliography of Educational Measurements. Compiled by the Bureau of Cooperative Research. Vol. I, No. 5, 1925. 147 p. (Supply exhausted.)

Proceedings of the Twelfth Conference on Educational Measurements. Vol. I, No. 6, 1925. 76 p.

The Effect of Population upon Ability to Support Education. By Harold F. Clark. Vol. II, No. 1, 1925. 28 p.

Proceedings of the High School Principals' Conference (November 20 and 21, 1925). Vol. II, No. 2, 1925. 77 p. (Supply exhausted.)

A Cross-Indexed Bibliography on School Budgets. By Harold F. Clark. Vol. II, No. 3, 1926. 66 p.

A Comparison of the Results Made on Certain Standardized Tests by Pupils in the Bloomington High School Who Were Taught in Classes of the Same Grade by University Student Teachers and by Regular High School Teachers. By Carl G. F. Franzén. Vol. II, No. 4, 1926. 19 p.

Proceedings of the Thirteenth Annual Conference on Educational Measurements. Vol. II, No. 5, 1926. 103 p.

When to Issue School Bonds. By Harold Florian Clark and Paul Royalty. Vol. II, No. 6, 1926. 16 p.

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Second Revision of the Bibliography of Educational Measurements. By Henry Lester Smith and Wendell William Wright. Vol. IV, No. 2, 1927. 251 p. (75¢)

Bibliography of School Buildings, Grounds, and Equipment, Part I. By Henry Lester Smith and Leo Martin Chamberlain. Vol. IV, No. 3, 1928. 326 p. (75¢)

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The Economic Effects of Education. By Harold F. Clark. Vol. IV, No. 5, 1928. 39 p.

Proceedings of the Fifteenth Annual Conference on Educational Measurements. Vol. IV, No. 6, 1928. 73 p.

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